



CHAPTER WISE TOPIC WISE NOTES CLASS IX MATHEMATICS



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AS PER LATEST CBSE CURRICULUM 2024-25

Chapter 3: Coordinate Geometry

Concepts Covered:

- | | |
|----|--|
| 1. | Introduction to Coordinate Geometry
➤ Coordinate Geometry Terms |
| 2. | Cartesian System
➤ Number line
➤ Cartesian Plane
➤ Parts of Cartesian Plane
➤ Coordinate of a Point
➤ Quadrant |
| 3. | Signs of Coordinates in different Quadrants |
| 4. | Plotting a Point in the Plane if its Coordinates are given |
| 5. | Mind Map
(Colourful & Interactive/ Complete All Concept Covered) |
| | Practice Questions (All Topics Available) |

INTRODUCTION TO COORDINATE GEOMETRY

A plane is any flat surface which can go on infinitely in both of the directions. Now, if there is a point on a plane, you can easily locate that point with the help of coordinate geometry. Using the two numbers of the coordinate geometry, a location of any point on the plane can be found.

A coordinate geometry is a branch of geometry where the position of the points on the plane is defined with the help of an ordered pair of numbers also known as coordinates.

Coordinate Geometry Terms

Coordinate Geometry Definition	It is one of the branches of geometry where the position of a point is defined using coordinates.
What are the Coordinates?	Coordinates are a set of values which helps to show the exact position of a point in the coordinate plane.
Coordinate Plane Meaning	A coordinate plane is a 2D plane which is formed by the intersection of two perpendicular lines known as the x-axis and y-axis.

Suppose I put a small dot on a sheet of paper with pen. Can you locate this dot on the paper if I tell you that the dot is at the lower right corner of the paper?



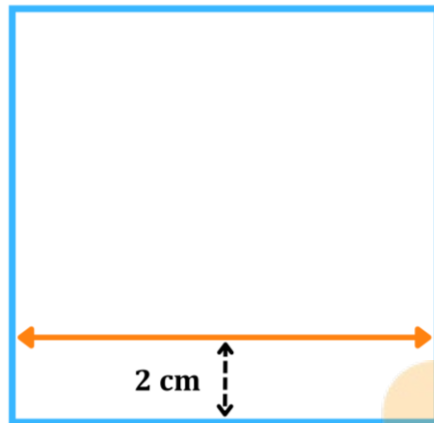
Now, you are able to see the dot but, can you tell me the exact position of the dot?

You will see that the information given above is not sufficient to fix the position of the dot.

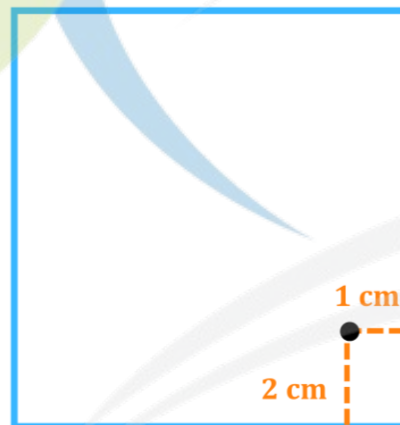
Now, if I tell you that the point is nearly 2 cm away from the bottom line of the paper then this will give some idea but still is not sufficient because this would mean that the point could be anywhere, which is 2 cm away from the bottom line.

COORDINATE GEOMETRY

INTRODUCTION TO COORDINATE GEOMETRY



Therefore, to fix the position of the dot we have to specify its distance from two fixed lines, the right edge and the bottom line of the paper. Therefore, if I say that the dot is also 1 cm away from the right edge of the paper, then we can easily fix the position of the dot.



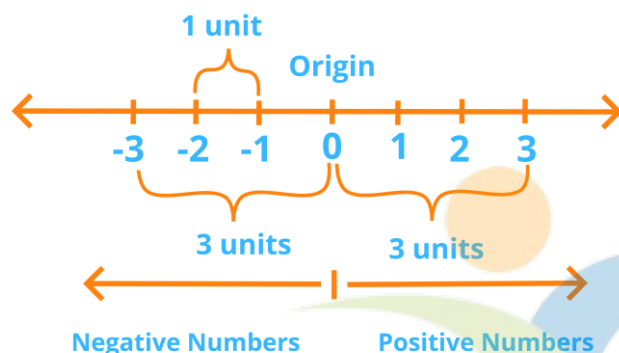
We see that position of any object lying in a plane can be represented with the help of two perpendicular lines.

Coordinate geometry is the branch of mathematics where we study the position of an object on a plane with reference to two mutually perpendicular lines in the same plane.

Coordinate geometry was initially developed by the French philosopher and Mathematician Rene Descartes. In his honour, the system used for describing the position of a point in a plane is also known as the Cartesian System.

CARTESIAN SYSTEM

Number Line



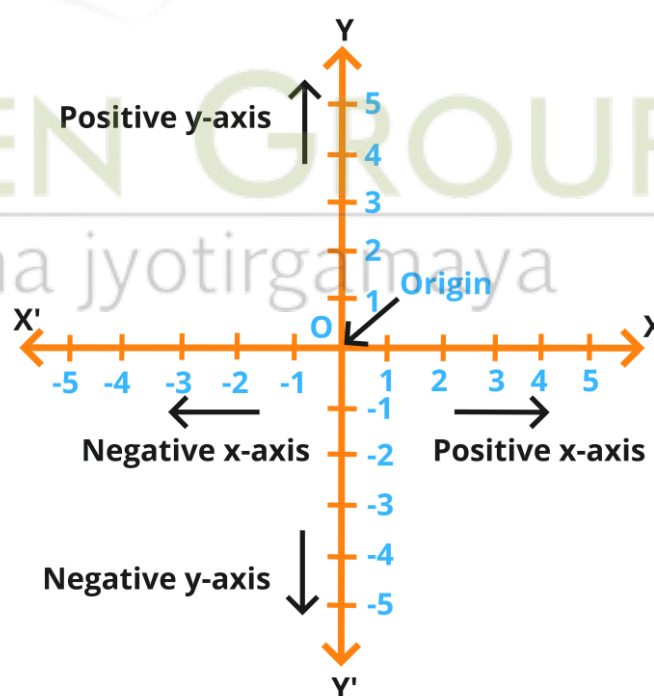
The number line is used to represent the numbers by marking points on a line at equal distances.

On a number line distances from the fixed point are marked in equal units positively in one direction and negatively in the other.

This fixed point from which the distances are marked is called the origin. In the figure O denotes the origin.

3 on number line is located at a distance of 3 units on the right side of origin O. Similarly, -3 is located at the same distance from origin but on its left side.

In Cartesian system, two perpendicular lines are used, one of them is horizontal XX' and the other is vertical YY' .



COORDINATE GEOMETRY

CARTESIAN SYSTEM

The horizontal line $X'X$ is called the x-axis and the vertical line $Y'Y$ is called the y-axis.

The point where $X'X$ and $Y'Y$ intersect is called the origin (denoted by O).

Directions OX and OY are the positive directions of X-axis and Y-axis, respectively.

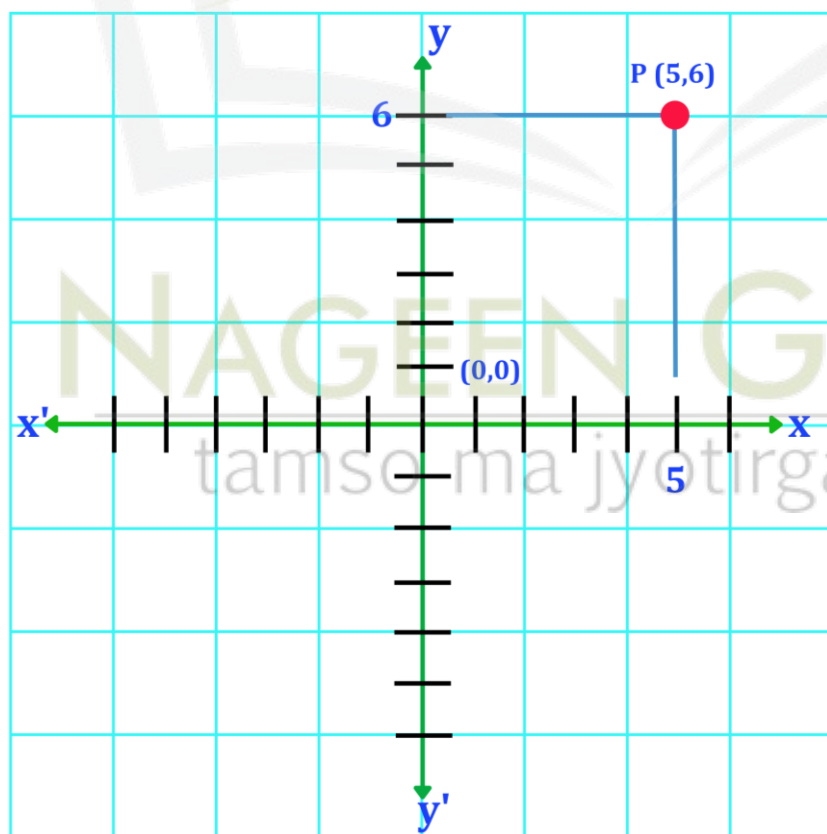
Similarly, directions OX' and OY' are the negative directions of X-axis and Y-axis, respectively.

Cartesian Plane

A cartesian plane is part of the cartesian coordinates system. This coordinate system can be translated into one, two, and three dimensions. In two dimensions, the plane is called the cartesian plane. It can also be called the coordinate plane.

A cartesian plane can be defined as a plane formed by the intersection of two coordinate axes that are perpendicular to each other. The horizontal axis is called the x-axis and the vertical one is the y-axis. These axes intersect with each other at the origin whose location is given as $(0, 0)$. Any point on the cartesian plane is represented in the form of (x, y) . Here, x is the distance of the point from the y-axis and y is the distance from the x-axis.

Example: The two horizontal and vertical intersecting lines are the x and y axes respectively. The coordinates of the point $(5, 6)$ indicate that it is located at a distance of 5 units from the y-axis and 6 units from the x-axis.



Parts of a Cartesian Plane

A cartesian plane can be divided into three major parts. These three parts are vital when we try to locate a point on the cartesian plane or draw the graph of a certain function. These are given below as follows:

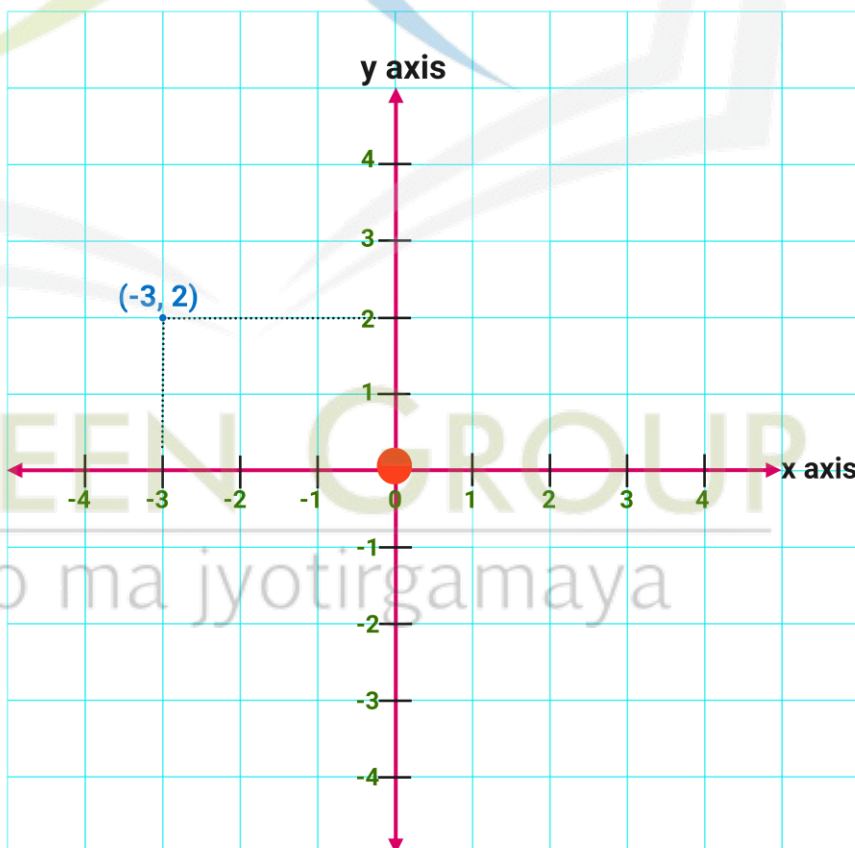
Axes- The two lines that intersect to form the cartesian plane are known as the axes. The horizontal line is called the x-axis. The vertical line that is perpendicular to the x-axis is known as the y-axis.

Origin- The point where the two perpendicular axes - x and y meet is known as the origin. The coordinates of the origin are given by (0, 0). The axes are divided into two equal parts by the origin.

Quadrants- When the x and the y axes intersect, it divides the cartesian plane into 4 regions. These are known as quadrants and extend infinitely.

Example 1: Plot the point $(-3, 2)$ on a cartesian plane.

Solution: As the coordinate is of the form $(-, +)$ hence, the point lies in the second quadrant. We move 3 spaces to the left of the origin and then 2 spaces upwards to get our point.



Example 2: State which quadrants the following points lie in.

- a. $(5.5, -1)$

COORDINATE GEOMETRY

CARTESIAN SYSTEM

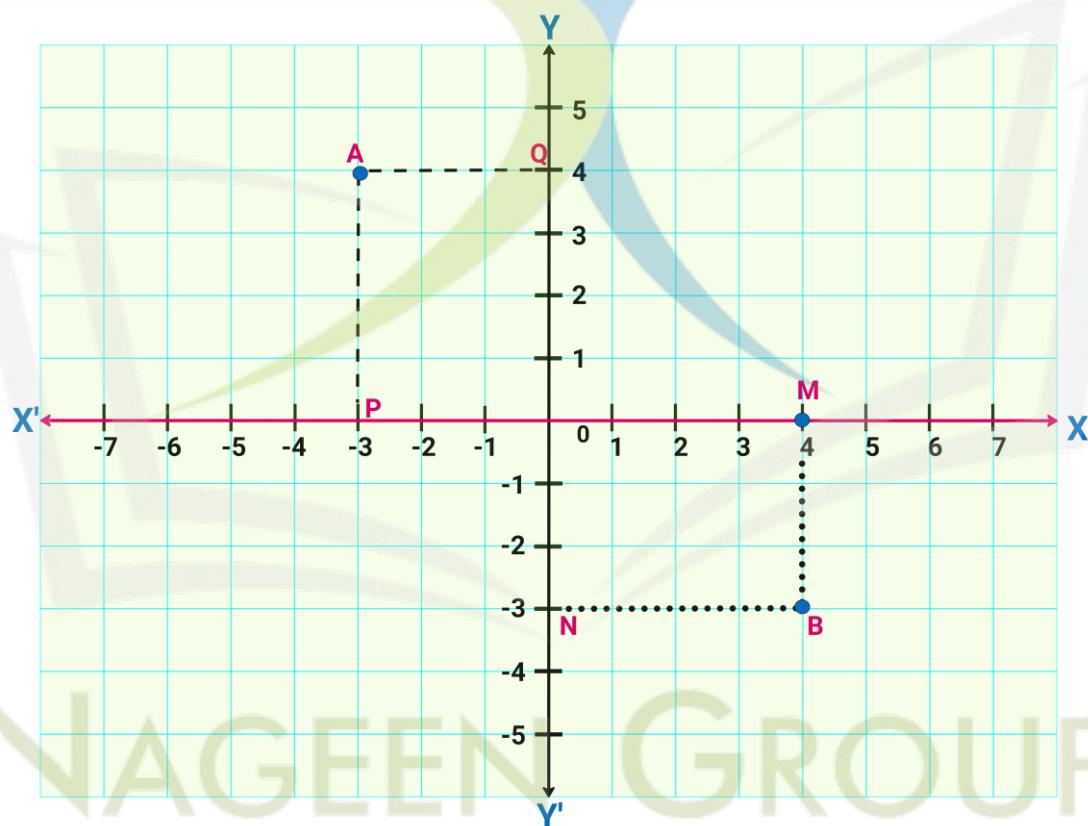
- b. $(-7, -3)$
 c. $(2, 3.45)$

Solution:

- a. As the $(5.5, -1)$ is of the form $(+, -)$, thus, it lies in the fourth quadrant.
 b. $(-7, -3)$ lies in the third quadrant as $x < 0$ and $y < 0$.
 c. As the sign of both coordinates is positive hence, $(2, 3.45)$ lies in the first quadrant.

Example 3: Find the coordinates of the following points on the cartesian plane:

Solution: Coordinates of A are $(-3, 4)$. It lies in the second quadrant. Coordinates of B are $(4, -3)$ and it lies in the fourth quadrant.



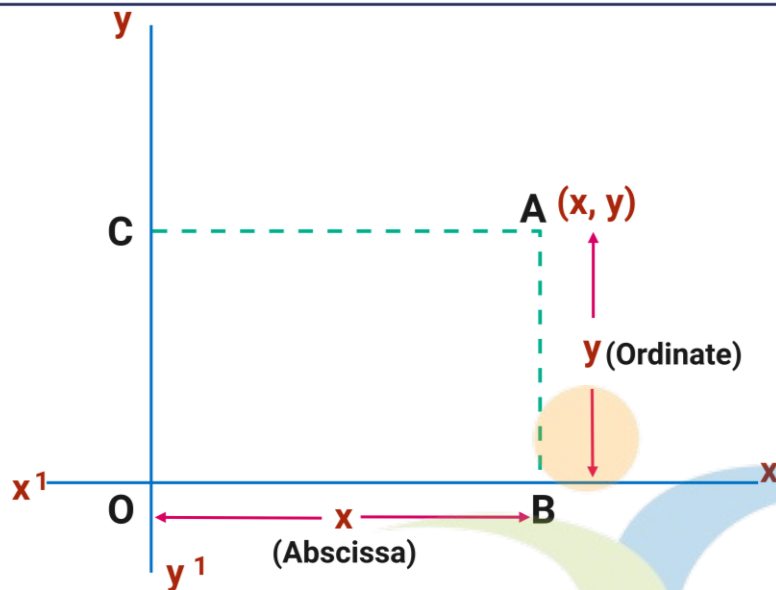
Coordinates of a Point

To write the coordinates of a point we need to follow these rules-

- The x-coordinate of a point is marked by drawing perpendicular from the y-axis measured a length of the x-axis. It is also called the Abscissa.
- The y-coordinate of a point is marked by drawing a perpendicular from the x-axis measured a length of the y-axis. It is also called the Ordinate.
- While writing the coordinates of a point in the coordinate plane, the x-coordinate comes first, and then the y-coordinate. We write the coordinates in brackets.

COORDINATE GEOMETRY

CARTESIAN SYSTEM



In the above figure, $OB = CA = x$ coordinate (Abscissa), and $CO = AB = y$ coordinate (Ordinate).

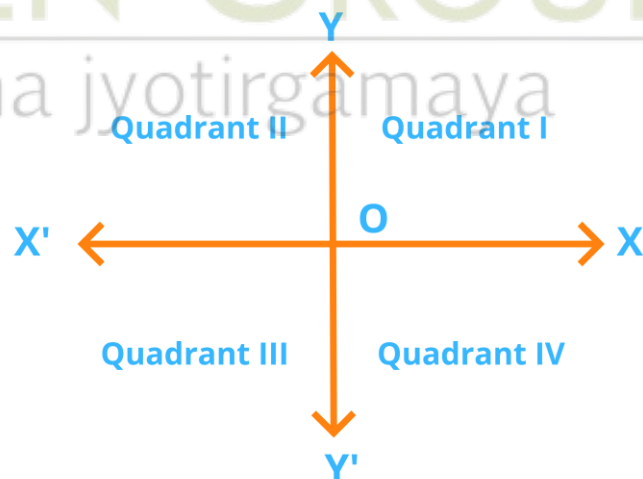
We write the coordinate as (x, y) .

Remark: As the origin O has zero distance from the x -axis and the y -axis so its abscissa and ordinate are zero. Hence the coordinate of the origin is $(0, 0)$.

Quadrant

The axes (plural of the word 'axis') divide the plane into four parts. These four parts are called the quadrants $\frac{1}{4}$ th part, numbered I, II, III and IV anticlockwise from OX .

XOY	I Quadrant
$X'OY$	II Quadrant
$X'OY'$	III Quadrant
XOY'	IV Quadrant



COORDINATE GEOMETRY**CARTESIAN SYSTEM**

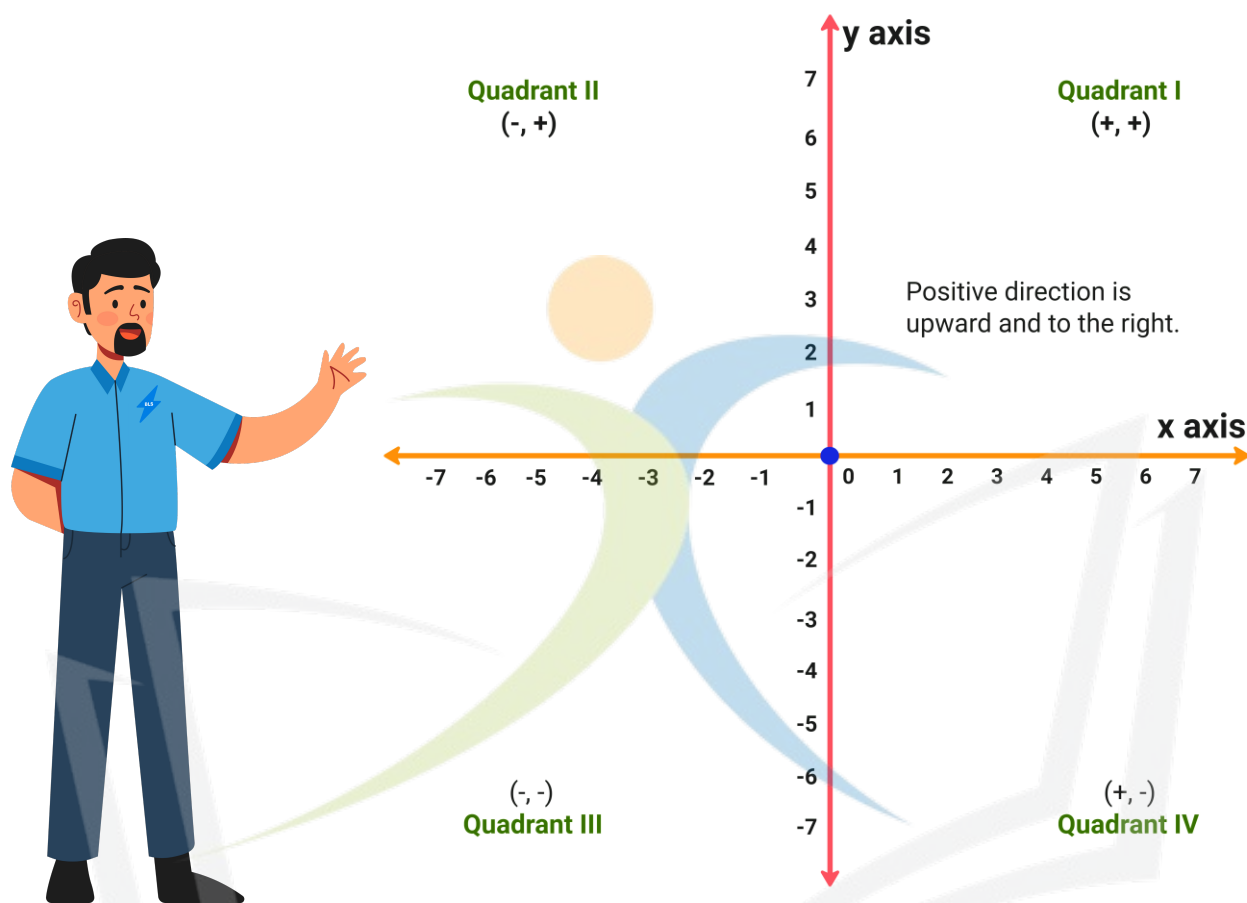
The plane consists of the axes and the four quadrants. We call the plane, the Cartesian plane, or the coordinate plane, or the xy-plane. The axes are called the coordinate axes.

A plane is a flat surface that goes infinitely in both directions.



COORDINATE GEOMETRY

SIGNS OF COORDINATES IN DIFFERENT QUADRANTS

SIGNS OF COORDINATES IN DIFFERENT QUADRANTS

Quadrant	Coordinate	Sign in the quadrant
I	(+, +)	1 st quadrant is enclosed by the positive x-axis and the positive y-axis.
II	(-, +)	2 nd quadrant is enclosed by the negative x-axis and the positive y-axis.
III	(-, -)	3 rd quadrant is enclosed by the negative x-axis and the negative y-axis.
IV	(+, -)	4 th quadrant is enclosed by the positive x-axis and the negative y-axis.

Sign Convention

The ray OX on X-axis is taken as positive, OX' as negative X-axis, OY on Y-axis as positive and OY' as negative.

Accordingly, the distance measured along OX will be taken as positive and along OX' will be negative. Similarly, the distance along OY will be taken as positive and along OY' will be negative.

COORDINATE GEOMETRY

SIGNS OF COORDINATES IN DIFFERENT QUADRANTS

- I-quadrant (+, +)
- II-quadrant (-, +)
- III-quadrant (-, -)
- IV-quadrant (+, -)

Example: Write the quadrant in which each of the following points lie:

- a. (-2, -4)
- b. (1, -4)
- c. (-3, 2)

Solution:

- a. (-2, -4)

Here, x coordinate = -2 and y coordinate = -4

As x coordinate and y coordinate both are negative ($x < 0$, $y < 0$), the given point lies in III quadrant.

- b. (1, -4)

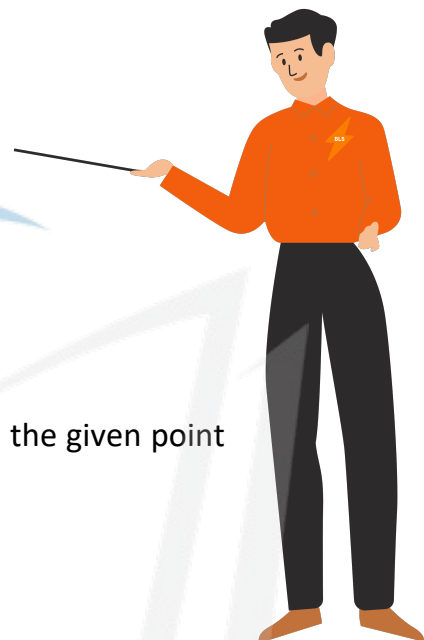
Here, x coordinate = 1 and y coordinate = -4

As x coordinate is positive and y coordinate is negative ($x > 0$, $y < 0$) the given point lies in IV quadrant.

- c. (-3, 2)

Here, x coordinate = -3 and y coordinate = 2

As x coordinate is negative and y coordinate is positive ($x < 0$, $y > 0$) the given point lies in II quadrant.



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COORDINATE GEOMETRY

PLOTING A POINT IN THE PLANE IF ITS COORDINATES ARE GIVEN

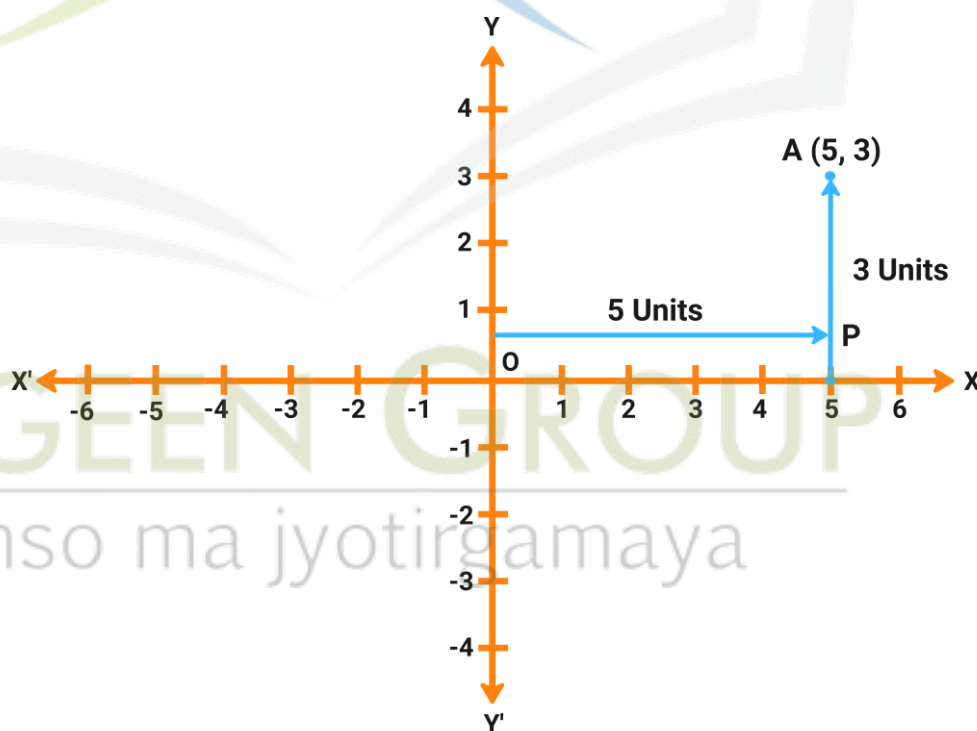
PLOTTING A POINT IN THE PLANE IF ITS COORDINATES ARE GIVEN

A coordinate plane is a two-dimensional plane formed by the intersection of a vertical line known as y-axis and a horizontal line known as x-axis. These are the perpendicular lines that intersect each other at a point known as the origin.

Plotting a point in plane if its coordinates are given:

In order to plot the points in a plane we follow the steps given below:

1. We first draw two mutually perpendicular lines on the graph paper, one horizontal XX' and the other is vertical YY' .
2. Mark their point of intersection as O (origin). The line XOX' is the x-axis and the line YOY' is the y-axis.
3. Next, we get the coordinates of the point which is to be plotted. Let the point be $A(5, 3)$.
4. To plot this point, we start from origin, and move 5 units in the positive direction along x-axis and mark the corresponding point as P.
5. Now, starting from P we move 3 units in the positive direction of y-axis.
6. The point where we arrive finally is the required point.



Example: Plot the point $P(2, -4)$ on a graph paper and from it draw PM and PN perpendiculars to x-axis and y-axis respectively. Write the coordinates of the point M and N .

We first draw two mutually perpendicular lines on the graph paper, one horizontal XX' and the other vertical (YY').

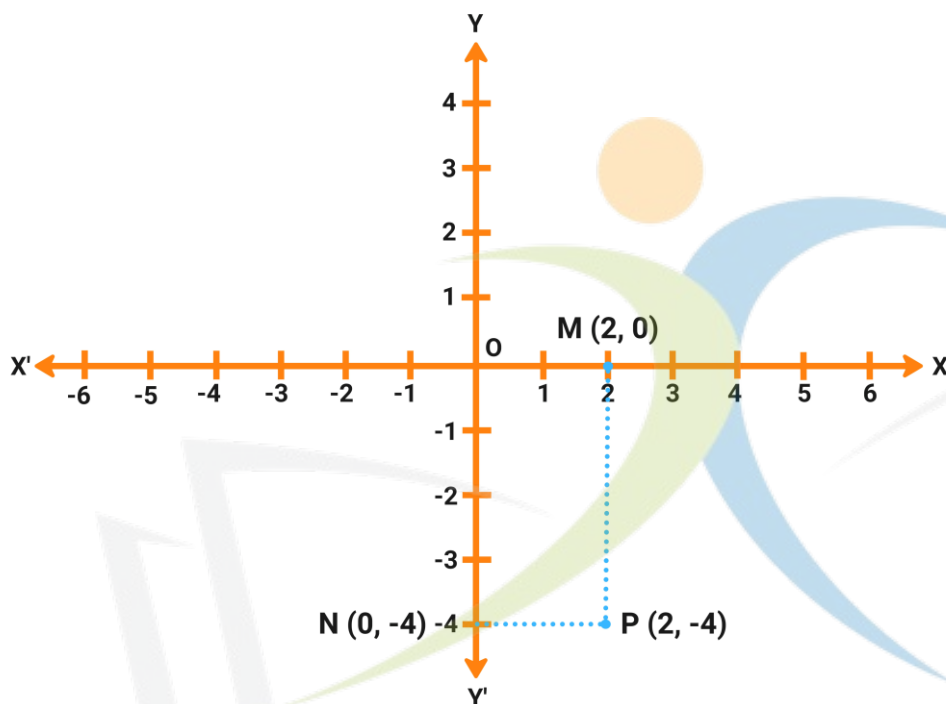
Mark their point of intersection as O (origin).

COORDINATE GEOMETRY**PLOTTING A POINT IN THE PLANE IF ITS COORDINATES ARE GIVEN**

To plot point $(2, -4)$ we start from origin, and move 2 units along x-axis in the positive direction and then we move 4 units in negative direction of y-axis.

We reach the point $P(2, -4)$. From point P draw PM and PN perpendiculars to x-axis and y-axis respectively.

Coordinate of M and N are $(2, 0)$ and $(0, -4)$ respectively.

**How Do You Find the Points on a Coordinate Plane?**

To find the point on the coordinate plane, you have to follow the steps given below:

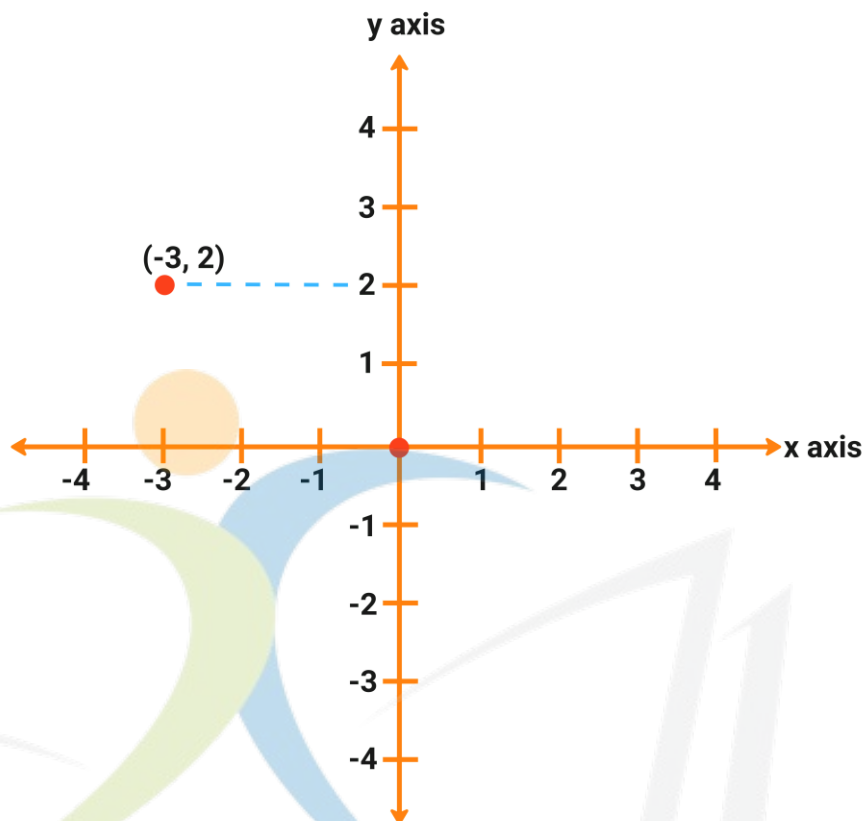
- First, you have to locate the point.
- Then, you have to find the quadrant by looking at the symbols of its x and y coordinates.
- The x-coordinate or abscissa of the point is then determined by reading the number of units right/left of the origin along the x-axis.
- Finally, you have to find the y-coordinate or the point by reading the number of units above or below the origin along the y-axis of parallel to it.

Example 1: Now, look at the diagram given below:



COORDINATE GEOMETRY

PLOTTING A POINT IN THE PLANE IF ITS COORDINATES ARE GIVEN

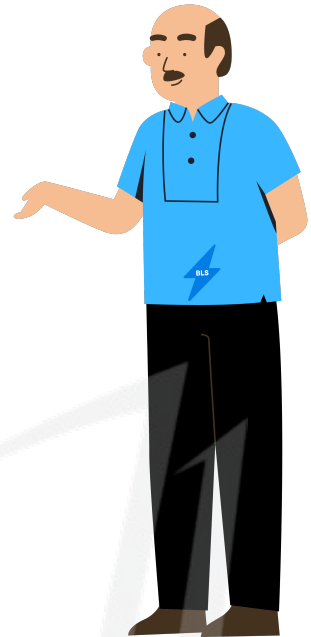
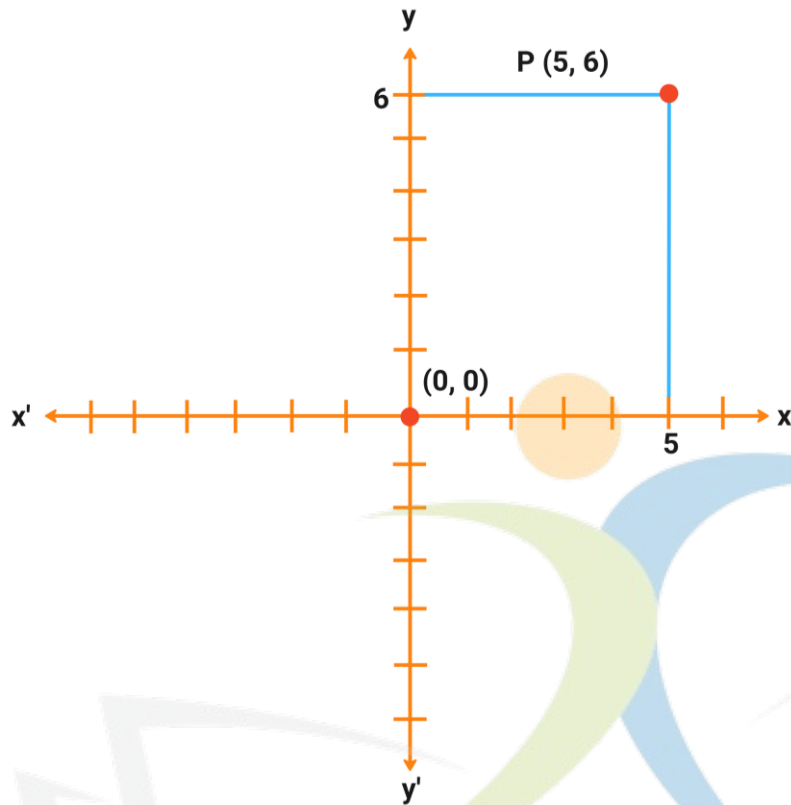


- First, observe the red dot given on the coordinate graph.
- It is placed at the second quadrant.
- Now, here the point is 3 units far from the origin along the negative x-axis.
- And the point is 2 units far from the origin parallel to the positive y-axis.

Example 2: We shall plot the point $P = (5, 6)$. To plot the point in the coordinate plane, you have to follow the given steps below:

- You have to draw two perpendicular lines, x-axis and y-axis.
- From the point of origin, you have to move 5 units to the right side along the positive x-axis.
- Now, you have to move 6 units up, parallel to the positive y-axis.
- Here, you mark the point of intersection and mark it as (5, 6).



COORDINATE GEOMETRY**PLOTTING A POINT IN THE PLANE IF ITS COORDINATES ARE GIVEN**

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Coordinate Geometry

DPP-01

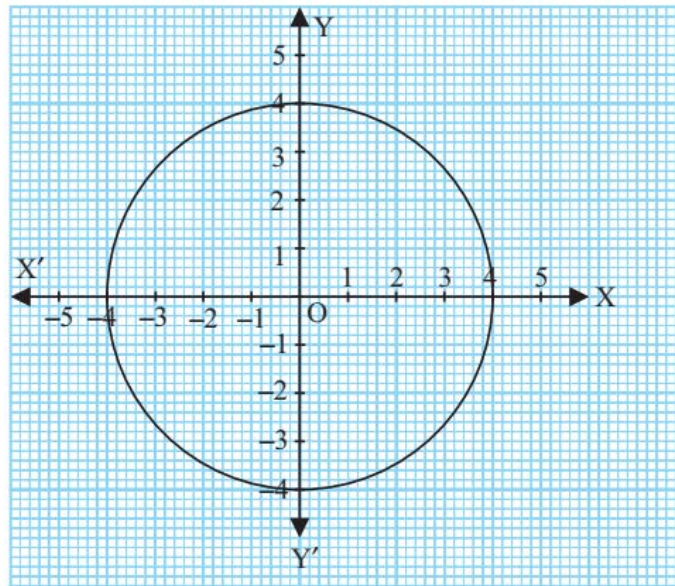
[Topic: The Cartesian System]

Very Short Answer Type Questions

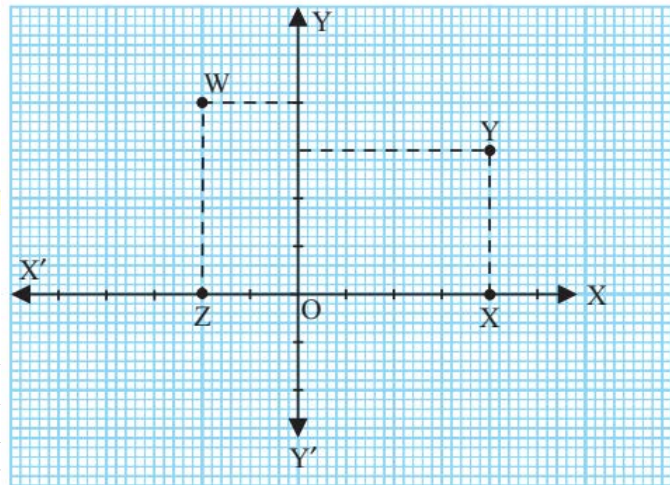
- Where do the following points lie on the Cartesian plane?
 - (2,0)
 - (-5, -7)
 - (0, -5)
 - (6,3)
 - $(0, \frac{1}{2})$
 - (-3,4)
- Write any two points lying on the positive direction of y -axis.
- In which quadrant do the point $(-2,5)$ lie?
- A point has both the coordinates negative, where does it lie?
- The point (a, b) lies in the IV quadrant. Find which of a or b is greater?
- If the coordinates of two points are $P(-2,3)$ and $Q(-3,5)$, then find:
Abscissa of P – Abscissa of Q
- Find the perpendicular distance of the point $P(4,6)$ from x -axis.
- Where does a point lie in the Cartesian plane if its ordinate is -3 and abscissa is 2 ?
- A policeman and a thief are equidistant from a jewel box. Upon considering jewel box as origin, the position of policeman is $(0,5)$. If the abscissa of the position of thief is zero, then write the co-ordinates of the position of thief.

Short Answer Type Questions-I

- Give names of distances of a point from x -axis and y -axis.
- The perpendicular distance of a point from x -axis is 4 units and the perpendicular distance from the y -axis is 5 units. Write the coordinates of such a point if it lies in:
 - I quadrant
 - II quadrant
 - III quadrant
 - IV quadrant
- On which axes the following points lie? $(0,4)$, $(-5,0)$, $(5,0)$ and $(0,-3)$
- In the given figure of a circle, write the coordinates of the points where circle meets the axes.



14. Write the coordinates of the points X, Y, Z and W from the figure.



Short Answer Type Questions-II

15. Write the coordinates of a point:

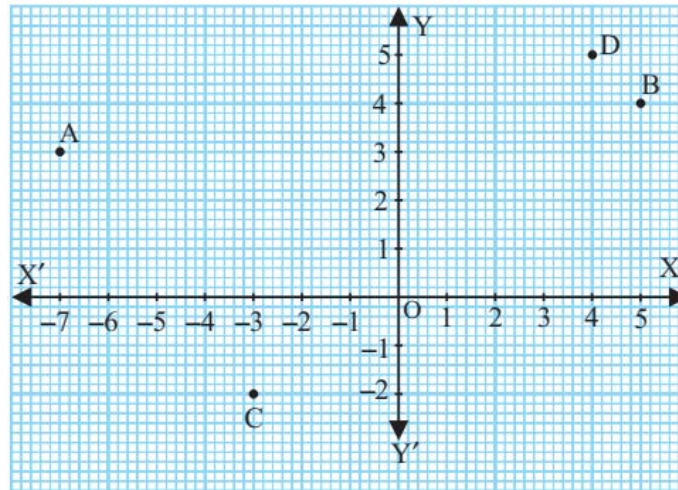
- (i) whose ordinate is -5 and which lies on y-axis.
- (ii) which lies on x and y axes both.
- (iii) whose abscissa is -3 and which lies on x-axis.

16. Mark the points $A(2,2)$, $B(2,-2)$, $C(-2,-2)$ and $D(-2,2)$ on a graph paper and join these points in order. Identify the figure so obtained. Also find the area of the figure.

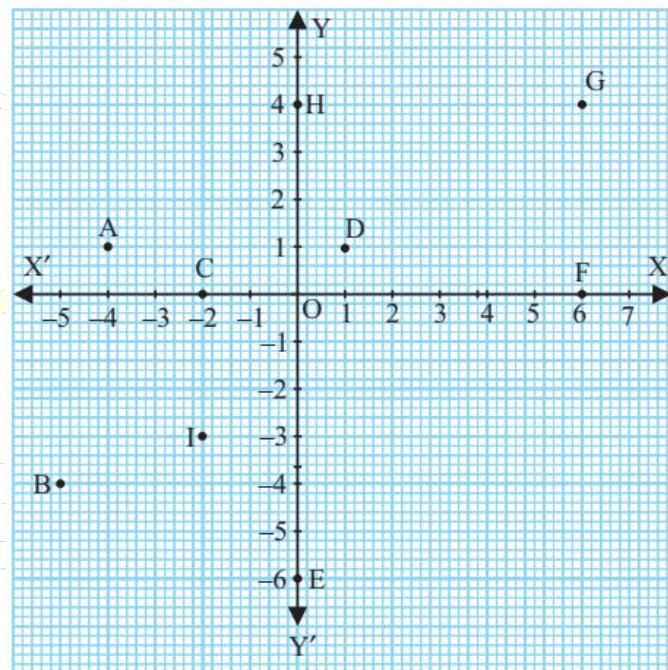
Long Answer Type Questions

17. See given figure and write the following:

- (i) Coordinates of point A
- (ii) Abscissa of point D
- (iii) The point whose coordinates are (5,4)
- (iv) Coordinates of point C.

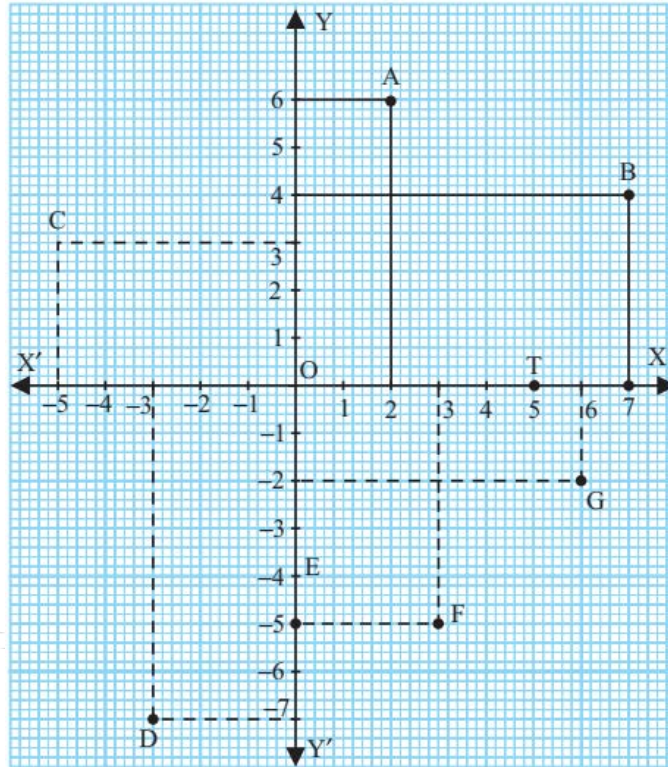


18. Write the coordinates of the points A, B, C, D, E, F, G, H and I from the graph.



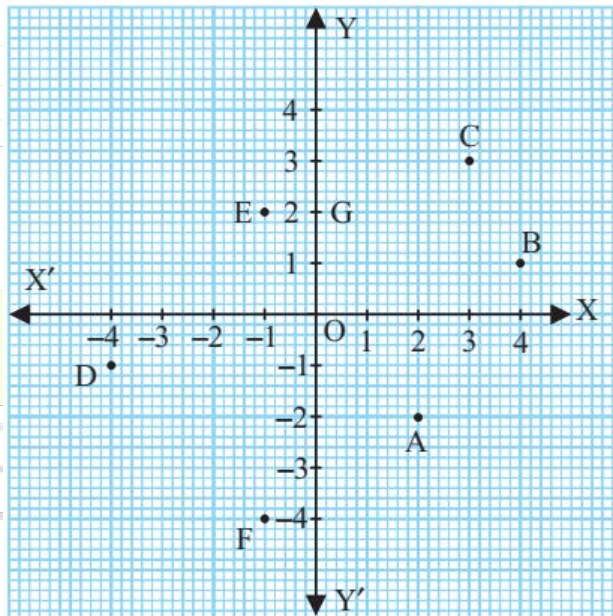
19. From given figure, find the following:

- (i) Coordinates of point C,
- (ii) The point identified by the coordinates $(-3, -7)$.
- (iii) The abscissa of the point E.
- (iv) The ordinate of the point E.
- (v) Coordinates of point O.
- (vi) The quadrant in which point G lies.
- (vii) The perpendicular distance of the point A from the x -axis.
- (viii) The perpendicular distance of the point B from the y -axis.

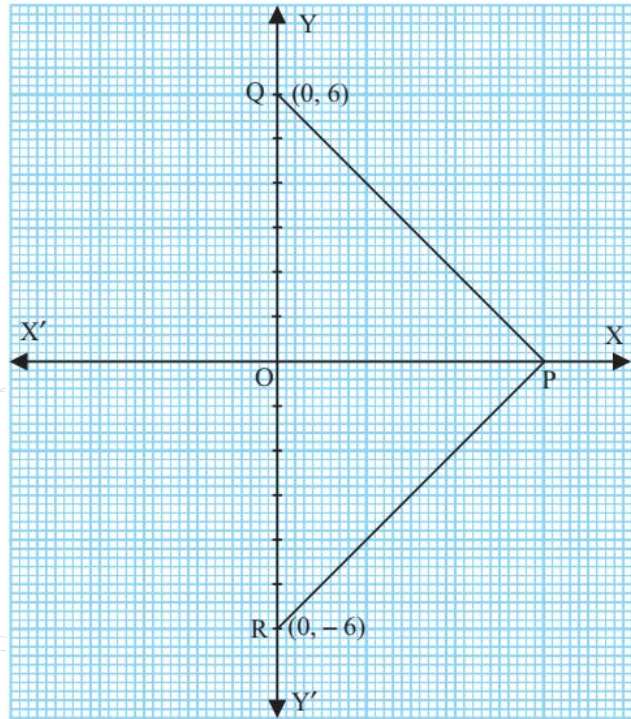


20. Observe the points plotted in the figure and find the following:

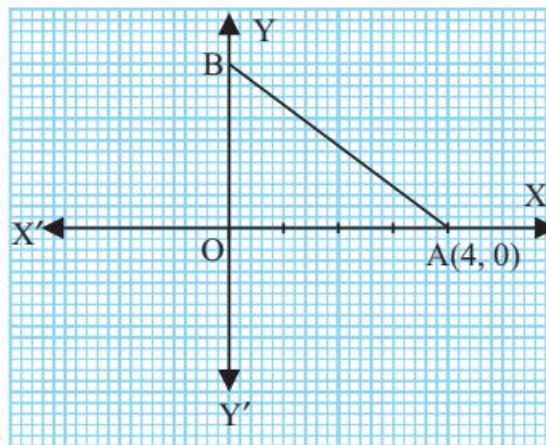
- The coordinates of E.
- The point with the coordinates $(-4, -1)$.
- The abscissa of A - Abscissa of B.
- The ordinate of C + Ordinate of F.



21. In the given figure, PQR is an equilateral triangle with the coordinates of Q and R as $(0, 6)$ and $(0, -6)$. Find the coordinates of the vertex P .

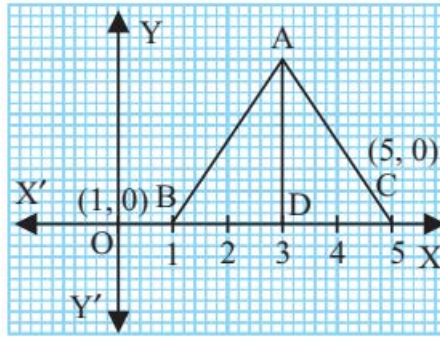


22. In the given figure, triangle AOB with coordinates of A and O as $(4,0)$ and $(0,0)$, $AB = 5$ units. Find the coordinates of B.

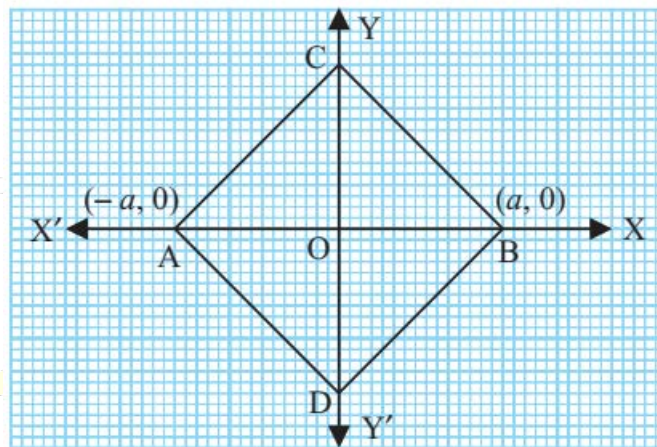


23. In the given figure, $\triangle ABC$ is an equilateral triangle with coordinates of B and C as $B(1,0)$ and $C(5,0)$. Find the coordinates of vertex A.

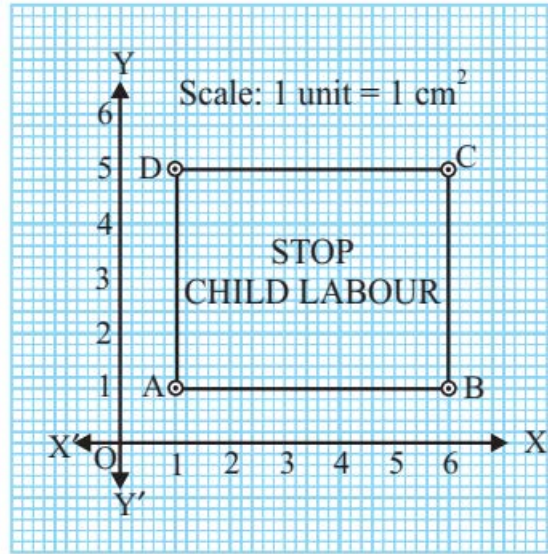
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24. In the given figure, $\triangle ABC$ and $\triangle ABD$ are equilateral triangles. Find the coordinates of points C and D.



25. Three students were made to stand on the points P , Q and S with coordinates $(1,1)$, $(6,1)$ and $(1,6)$ respectively in a playground to play a game. Find the coordinates of the fourth point R so that $PQRS$ forms a square. Which type of value would you infer from the question?
26. Some students of a school started a campaign against 'Child Labour' for which they prepare rectangular banners as shown in the figure. If cost of 1 cm^2 of banner is ₹3, find the cost incurred on preparing 5 banners for the campaign. What are the values exhibited by the students here?



27. On Environment Day, Class IX students got five plants of mango, silver oak, orange, banyan and amla from soil department. Students planted the plants and noted their locations as (x, y) keeping one point in the garden as origin.

	Mango	Silver Oak	Orange	Banyan	Amla
x	2	3	0	-3	-2
y	0	4	7	4	0

Plot the points (x, y) in the graph and join them in the given order. Name the figure you get.
Which social act is being done by students of Class-IX?

Coordinate Geometry

DPP-02

[Topic: Plotting a Point in Cartesian Plane]

Very Short Answer Type Questions

1. If $P(-2,3)$, $Q(5,0)$, $R(0,2)$ and $S(-4,0)$ are plotted on the graph paper, which of these lie on x -axis?
2. Find the image of the point $(4,5)$ along x -axis.
3. Find the reflection of point $(-1,3)$ along y -axis.

Short Answer Type Questions-I

4. Plot the following points on graph paper and check whether they are collinear or not:
(i) $(2,3)$, $(3,2)$, $(1,-5)$
(ii) $(-3,3)$, $(-5,5)$, $(1,-1)$
5. Plot the points $P(-2,-1)$, $Q(-1,-2)$, $R(2,1)$ and $S(3,3)$ on the graph paper, Join them and write the name of the figure thus obtained.
6. Plot the following points. Join them in order and write the name of the figure thus obtained.
 $A(2,0)$, $B(4,0)$, $C(4,2)$ and $D(2,2)$
7. Plot the points $A(-8,4)$, $B(-4,-3)$, $C(3,-3)$ and $D(5,6)$ on the graph paper. Join them in order. Identify the figure so formed. Draw AC and BD . Also, write the coordinates of the point of intersection of BD with x -axis.

Short Answer Type Questions-II

8. Plot the points $A(-2,-2)$, $B(6,0)$, $C(0,4)$ and $D(-3,2)$ on the graph paper, Draw figure $ABCD$ and write in which quadrant A and D lie.
9. Plot the points $(-3,0)$, $(5,0)$ and $(0,4)$ on Cartesian plane. Name the figure formed by joining these points and find its area.
10. Plot the points $A(2,0)$, $B(2,2)$, $C(0,2)$ and draw the line segments OA , AB , BC and CO . What do you obtain? Find its area.
11. Plot the points $A(2,3)$, $B(2,1)$, $C(0,1)$, $D(0,3)$. Join the points orderwise and identify the figure thus obtained. Find the area and perimeter.
12. Locate the following points in the plane if their coordinates are given as $A(5,0)$, $B(0,3)$, $C(7,2)$, $D(-4,3)$, $E(-3,-2)$ and $F(3,-2)$.

COORDINATE GEOMETRY

INTRODUCTION TO COORDINATE GEOMETRY

(Practice Sheet)

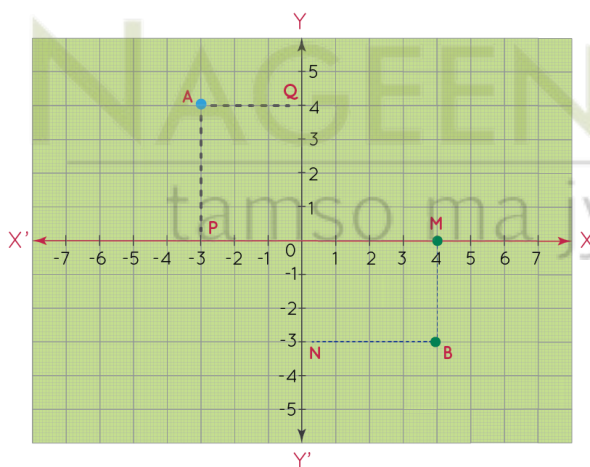
- 1** What is the purpose of using coordinates in coordinate geometry?
 - A. To draw shapes
 - B. To locate points on a plane
 - C. To calculate angles
 - D. To study three-dimensional space
- 2** In a coordinate plane, what does the x-axis represent?
 - A. Vertical line
 - B. Horizontal line
 - C. Diagonal line
 - D. Curved line
- 3** Why is specifying the distance from **only one** line insufficient to fix the position of a point?
 - A. Because one line is imaginary
 - B. Because it provides too much information
 - C. Because it doesn't give a direction
 - D. Because it doesn't uniquely determine the point's location
- 4** What term is used for the set of values that show the exact position of a point in the coordinate plane?
 - A. Coordinates
 - B. Parameters
 - C. Indices
 - D. Magnitudes
- 5** Who is the mathematician credited with the initial development of coordinate geometry?
 - A. Isaac Newton
 - B. Albert Einstein
 - C. René Descartes
 - D. Euclid
- 6** What is a coordinate plane, and how is it formed?
- 7** Define coordinates in the context of coordinate geometry.
- 8** What is a plane in coordinate geometry?
- 9** If a point is located at (3, 4) on a coordinate plane, what does each number represent?
- 10** How is the origin denoted in coordinate geometry?

COORDINATE GEOMETRY

CARTESIAN SYSTEM

(Practice Sheet)

- 1 What are the coordinates of the origin in a Cartesian plane?
 - A. (1, 0)
 - B. (0, 1)
 - C. (0, 0)
 - D. (1, 1)
- 2 What is the x-coordinate of a point?
 - A. Abscissa
 - B. Ordinate
 - C. Applicate
 - D. Appoggiatura
- 3 How is the Cartesian plane divided when the x and y axes intersect?
 - A. Segments
 - B. Quarters
 - C. Sectors
 - D. Quadrants
- 4 What is the significance of coordinates (2, 3) in a Cartesian plane?
 - A. Second Quadrant
 - B. Third Quadrant
 - C. First Quadrant
 - D. Fourth Quadrant
- 5 Which quadrant does the point (-4, -5) belong to?
 - A. First Quadrant
 - B. Second Quadrant
 - C. Third Quadrant
 - D. Fourth Quadrant
- 6 Plot the point (-3, 2) on a cartesian plane.
- 7 State which quadrants the following points lie in.
 - a) (5.5, -1)
 - b) (-7, -3)
 - c) (2, 3.45)
- 8 Find the coordinates of the following points on the cartesian plane:



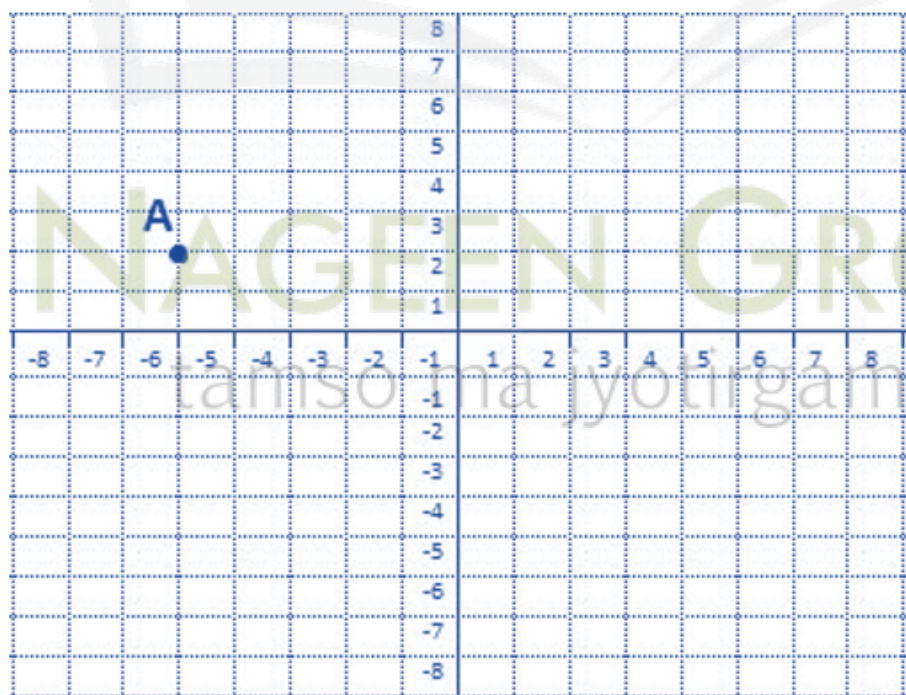
- 9 Plot the point (2, 3) on the cartesian plane.
- 10 Plot the point (-3, 4) on the cartesian plane.

COORDINATE GEOMETRY

SIGNS OF COORDINATES IN DIFFERENT QUADRANTS

(Practice Sheet)

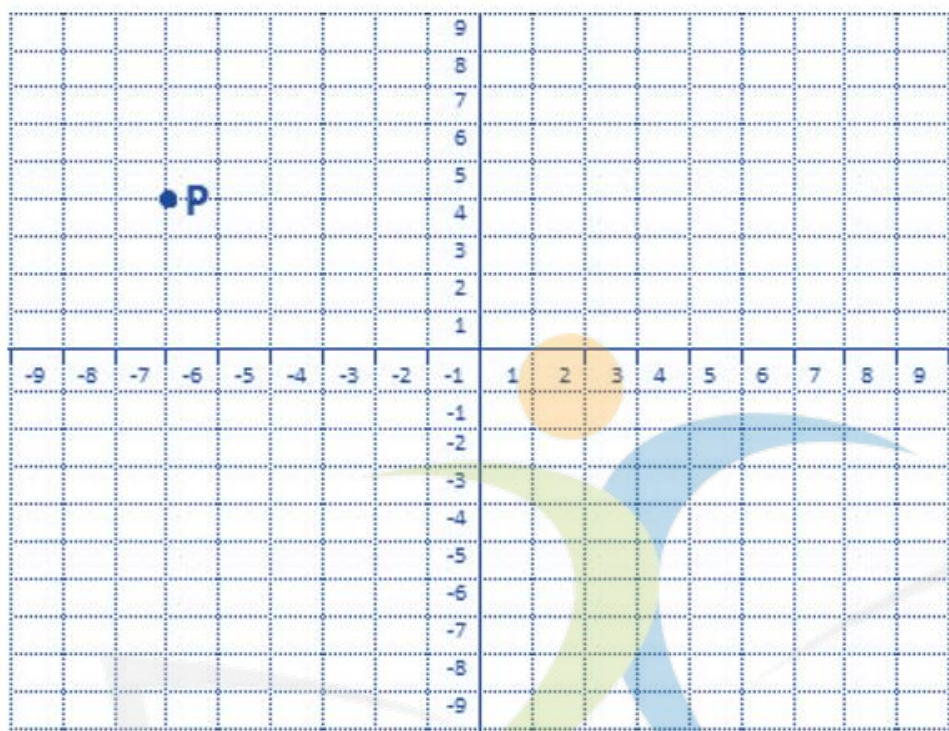
- 1 What is the quadrant in which the point (3, 5) lies?
 - A. I-quadrant
 - B. II-quadrant
 - C. III-quadrant
 - D. IV-quadrant
- 2 For a point in the II-quadrant, which coordinate is positive?
 - A. x-coordinate
 - B. y-coordinate
 - C. Both x and y coordinates
 - D. Neither x nor y coordinates
- 3 In which quadrant does the point (-5, -7) lie?
 - A. I-quadrant
 - B. II-quadrant
 - C. III-quadrant
 - D. IV-quadrant
- 4 If a point has a positive x-coordinate and a negative y-coordinate, it is located in which quadrant?
 - A. I-quadrant
 - B. II-quadrant
 - C. III-quadrant
 - D. IV-quadrant
- 5 For a point in the III-quadrant, what can be said about its coordinates?
 - A. Both coordinates are positive.
 - B. Both coordinates are negative.
 - C. The x-coordinate is negative, and the y-coordinate is positive.
 - D. The x-coordinate is positive, and the y-coordinate is negative.
- 6 What will be the coordinates of a point B if B is plotted as mirror image of A in 3rd Quadrant?



- 7 What will be the coordinates of a point Q if Q is plotted diagonally opposite to P in 4th Quadrant?

COORDINATE GEOMETRY

SIGNS OF COORDINATES IN DIFFERENT QUADRANTS



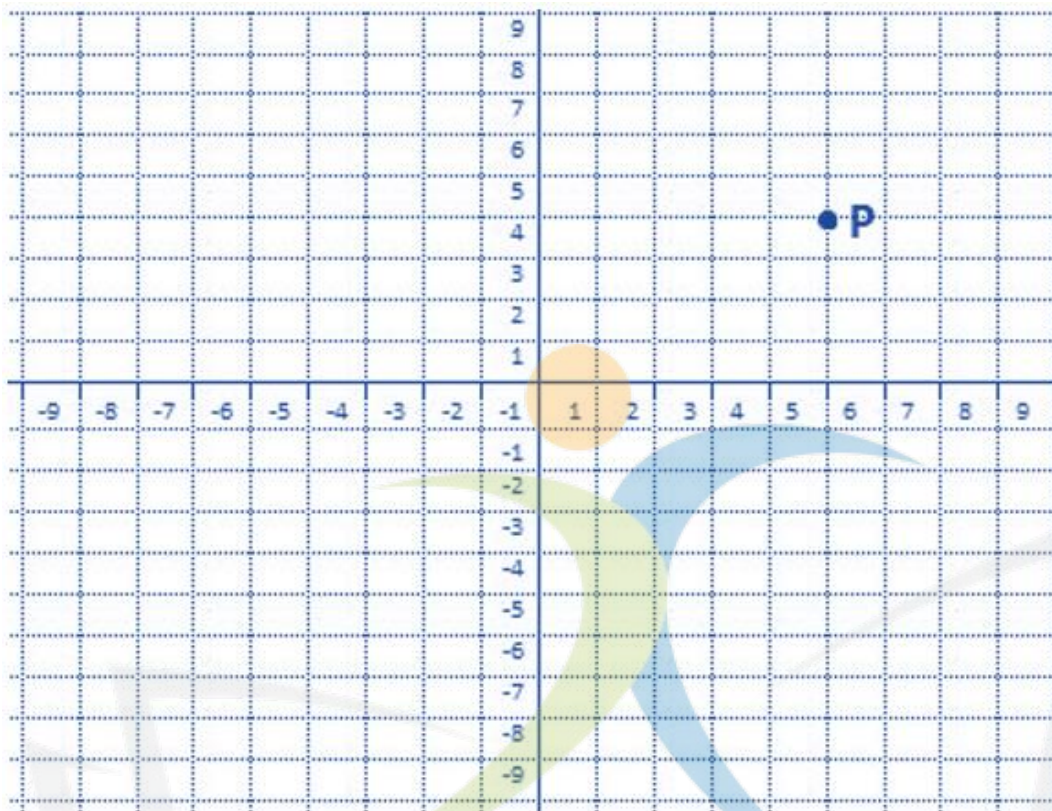
- 8 What will be the coordinates of a point B if it is 2 units above origin in y axis direction and 2 units to the left of A in x-axis direction?



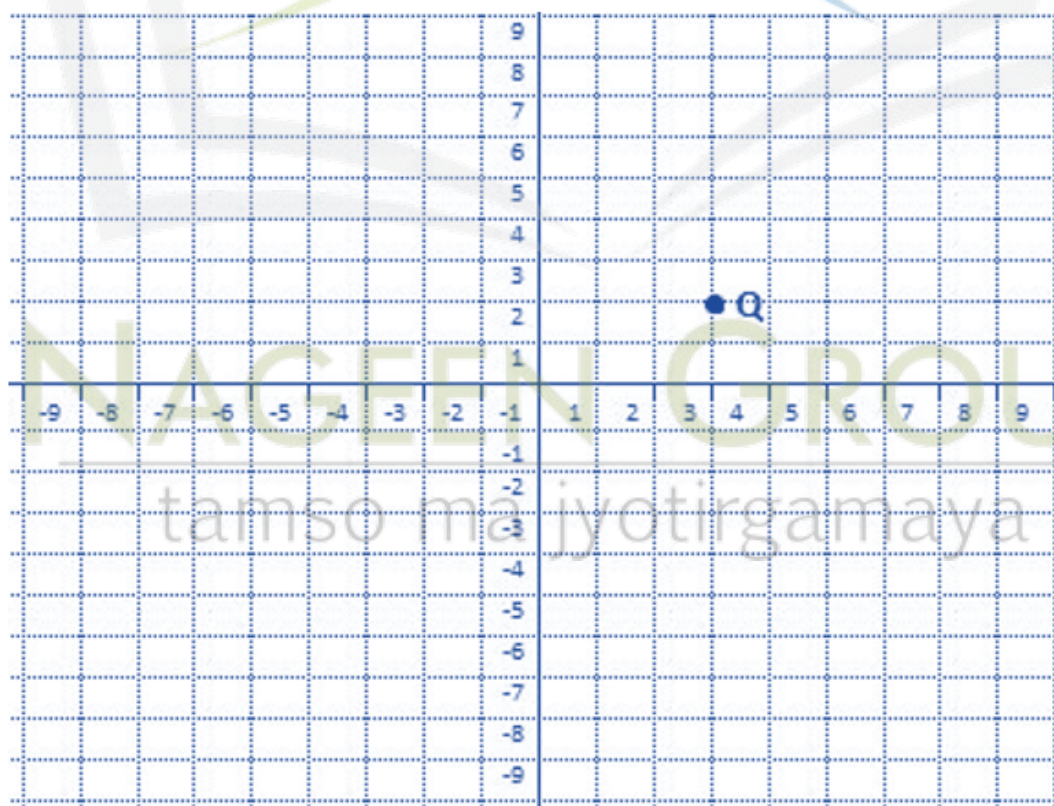
- 9 What will be the perpendicular distance of point P from x-axis?

COORDINATE GEOMETRY

SIGNS OF COORDINATES IN DIFFERENT QUADRANTS



- 10 What will be the perpendicular distance of point Q from y-axis?



COORDINATE GEOMETRY

PLOTING A POINT IN THE PLANE IF ITS COORDINATES ARE GIVEN

(Practice Sheet)

- 1 In a coordinate plane, what is the point of intersection of the x-axis and y-axis called?
A. Point M
B. Point N
C. Point P
D. Origin (O)
- 2 If a point is located in the third quadrant, where is it with respect to the x and y coordinates?
A. Positive x, Positive y
B. Negative x, Positive y
C. Negative x, Negative y
D. Positive x, Negative y
- 3 When finding the coordinates of a point, the number of units right/left of the origin along the x-axis is known as:
A. Ordinate
B. Abscissa
C. Axis
D. Origin
- 4 To plot a point in the coordinate plane, what is the first step mentioned in the process?
A. Draw perpendicular lines
B. Locate the point
C. Find the quadrant
D. Move along the x-axis
- 5 What are the coordinates of point M when drawing perpendiculars PM and PN for the point P (2, -4)?
A. (2, 0)
B. (0, -4)
C. (2, -4)
D. (0, 0)
- 6 Plot the following points and write the name of the figure obtained by joining them in order: P (-3, 2), Q (-7, -3), R (6, -3), S (2, 2)
- 7 Plot the points p (2, 3) on the graph paper and from it draw a pm and pn perpendicularly to the x axis and the y axis respectively write the co-ordinate of m and n.
- 8 Plot the following point on the graph paper: (0, 7)
- 9 Plot the following points on the graph paper: (2, 5)
- 10 Plot the following points on the graph paper: (-3, 2)

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**Chapter 3-
Coordinate Geometry**

EXERCISE 3.1

Write the correct answer in each of the following:

1. Point $(-3, 5)$ lies in the
- A. first quadrant
 - B. second quadrant
 - C. third quadrant
 - D. fourth quadrant

Solution:

B. Second Quadrant

Explanation:

$(-3, 5)$ is of form $(-x, y)$.

In the point $(-3, 5)$ abscissa is negative and ordinate is positive. So, it lies in the second quadrant. Hence, (B) is the correct option.

2. Signs of the abscissa and ordinate of a point in the second quadrant are respectively
- A. +, +
 - B. -, -
 - C. -, +
 - D. +, -

Solution:

C. -, +

Explanation:

Signs of the abscissa and ordinate of a point in the second quadrant is -, +. Hence, (C) is the correct option.

3. Point $(0, -7)$ lies
- A. on the x-axis
 - B. in the second quadrant
 - C. on the y-axis
 - D. in the fourth quadrant

Solution:

C. on the y-axis

Explanation:

Since the abscissa is 0, Point $(0, -7)$ lies on y-axis.

Hence, (C) is the correct option.

4. Point $(-10, 0)$ lies
- A. on the negative direction of the x-axis
 - B. on the negative direction of the y-axis
 - C. in the third quadrant
 - D. in the fourth quadrant

Solution:

A. on the negative direction of the x-axis

Explanation:

Point $(-10, 0)$ lies on the negative direction of x-axis.
Hence, (A) is the correct option.

5. Abscissa of all the points on the x-axis is

- A. 0
- B. 1
- C. 2
- D. any number

Solution:

D. any number

Explanation:

Abscissa of all the points on the x-axis can be any number.
Hence, (D) is the correct option.

6. Ordinate of all points on the x-axis is

- A. 0
- B. 1
- C. -1
- D. any number

Solution:

A. 0

Explanation:

Ordinate of all the points on the x-axis is 0.
Hence, (A) is the correct option.

7. The point at which the two coordinate axes meet is called the

- A. abscissa
- B. ordinate
- C. origin
- D. quadrant

Solution:

C. origin

Explanation:

The points at which the two coordinate axes meet is called the origin.
Hence, (C) is the correct option.

8. A point both of whose coordinates are negative will lie in

- A. I quadrant
- B. II quadrant
- C. III quadrant
- D. IV quadrant

Solution:

C. III quadrant

Explanation:

A point whose both of the coordinate are negative will lie in the III quadrant.
Hence, (C) is the correct option.

9. Points $(1, -1)$, $(2, -2)$, $(4, -5)$, $(-3, -4)$
- A. lie in II quadrant
 - B. lie in III quadrant
 - C. lie in IV quadrant
 - D. do not lie in the same quadrant

Solution:

D. do not lie in the same quadrant

Explanation:

Points $(1, -1)$, $(2, -2)$, $(4, -5)$ lie in IV quadrant and $(-3, -4)$ lie in III quadrant.
Hence, (D) is the correct option.

10. If y coordinate of a point is zero, then this point always lies

- A. in I quadrant
- B. in II quadrant
- C. on x – axis
- D. on y – axis

Solution:

C. on x – axis

Explanation:

We know that if y-coordinate of a point, i.e., ordinate is zero, then this point always lies on x-axis.

Hence, (C) is the correct option.

11. The points $(-5, 2)$ and $(2, -5)$ lie in the

- A. same quadrant
- B. II and III quadrants, respectively
- C. II and IV quadrants, respectively
- D. IV and II quadrants, respectively

Solution:

C. on x – axis

Explanation:

$(-5, 2)$ is of the form $(-x, y)$ so it lies in the II quadrant.

$(2, -5)$ is of the form $(x, -y)$ so it lies in IV quadrant.

(C) II and IV quadrants, respectively

Hence, (C) is the correct option.

12. If the perpendicular distance of a point P from the x-axis is 5 units and the foot of the perpendicular lies on the negative direction of x-axis, then the point P has

- A. x – coordinate = -5
- B. y – coordinate = 5 only
- C. y – coordinate = -5 only
- D. y – coordinate = 5 or -5

Solution:

D. y – coordinate = 5 or -5

Explanation:

Perpendicular distance from x-axis = Ordinate = 5

The negative direction of x-axis doesn't decide the sign of the ordinate.

(D) y-coordinate = 5 or -5.

Hence, (D) is the correct option.

EXERCISE 3.2

1. Write whether the following statements are True or False? Justify your answer.

(i) Point (3, 0) lies in the first quadrant.

(ii) Points (1, -1) and (-1, 1) lie in the same quadrant.

(iii) The coordinates of a point whose ordinate is $-\frac{1}{2}$ and abscissa is 1 are $-\frac{1}{2}$, 1.

(iv) A point lies on y-axis at a distance of 2 units from the x-axis. Its coordinates are (2, 0).

(v) (-1, 7) is a point in the II quadrant.

Solution:

(i) Point (3, 0) lies in the first quadrant.

False

Justification:

The ordinate of the point (3, 0) is zero.

Hence, the point lies on the x-axis

(ii) Points (1, -1) and (-1, 1) lie in the same quadrant.

False

Justification:

(1, -1) lies in IV quadrant

(-1, 1) lies in II quadrant.

(iii) The coordinates of a point whose ordinate is $-\frac{1}{2}$ and abscissa is 1 are $-\frac{1}{2}$, 1.

False

Justification:

The coordinates of a point whose ordinate is $-\frac{1}{2}$ and abscissa is 1 is (1, -1/2).

(iv) A point lies on y-axis at a distance of 2 units from the x-axis. Its coordinates are (2, 0).

False

Justification:

A point lies on y-axis at a distance of 2 units from the x-axis. Its coordinates are (0, 2).

(v) (-1, 7) is a point in the II quadrant.

True

Justification:

(-1, 7) is a point in the II quadrant.

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EXERCISE 3.3

1. Write the coordinates of each of the points P, Q, R, S, T and O from the Fig. 3.5.

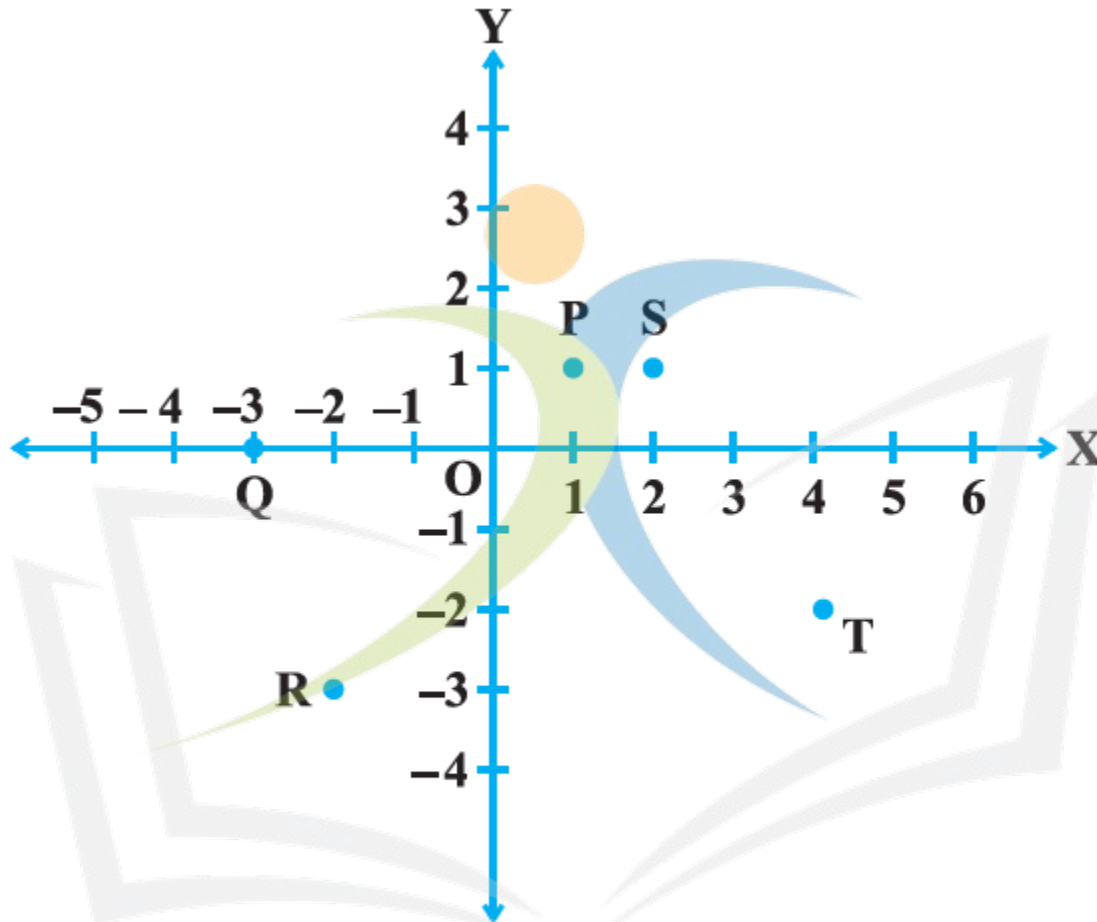


Fig. 3.5

Solution:

The coordinates of the points P, Q, R, S, T and O are as follows:

P = (1, 1)

Q = (-3, 0)

R = (-2, -3)

S = (2, 1)

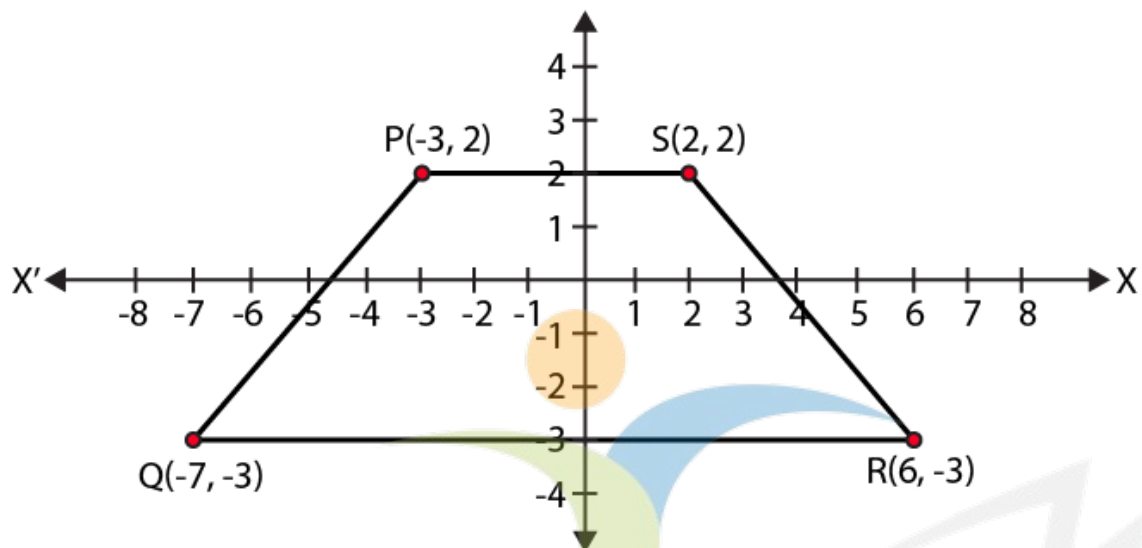
T = (4, -2)

O = (0, 0)

2. Plot the following points and write the name of the figure obtained by joining them in order:

P(-3, 2), Q(-7, -3), R(6, -3), S(2, 2)

Solution:

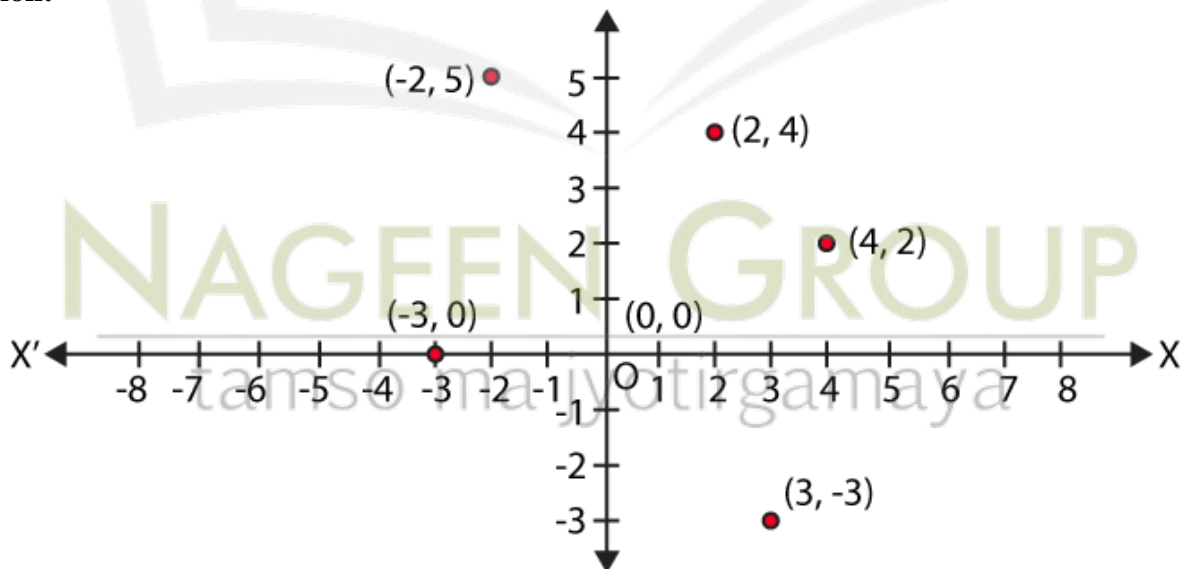


The figure obtained is a Trapezium.

3. Plot the points (x, y) given by the following table:

x	2	4	-3	-2	3	0
y	4	2	0	5	-3	0

Solution:

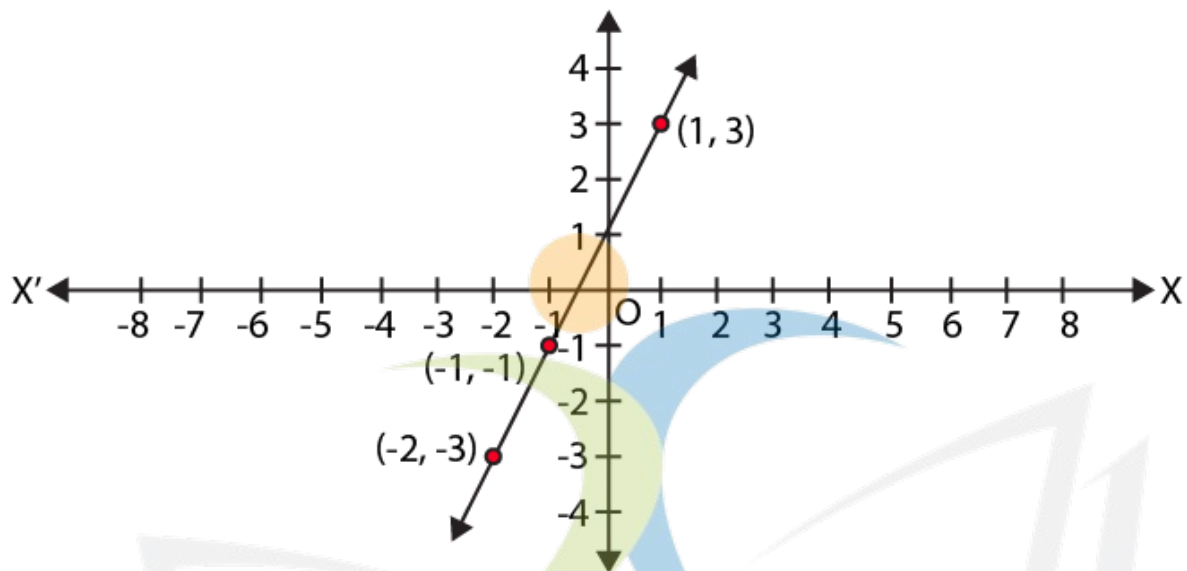


4. Plot the following points and check whether they are collinear or not:

- (i) $(1, 3), (-1, -1), (-2, -3)$
- (ii) $(1, 1), (2, -3), (-1, -2)$
- (iii) $(0, 0), (2, 2), (5, 5)$

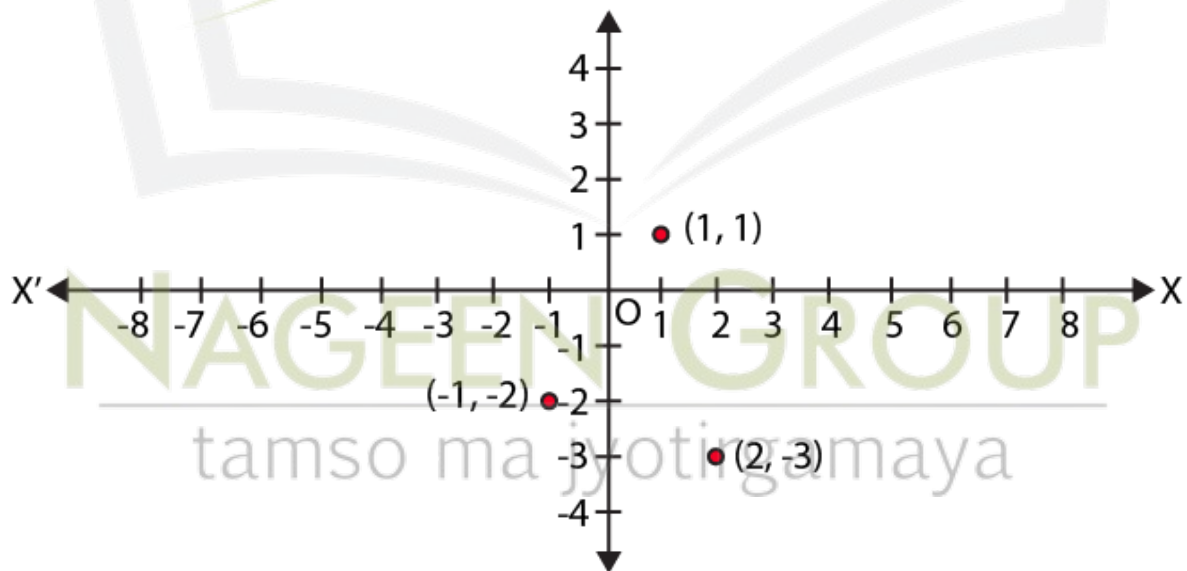
Solution:

(i)



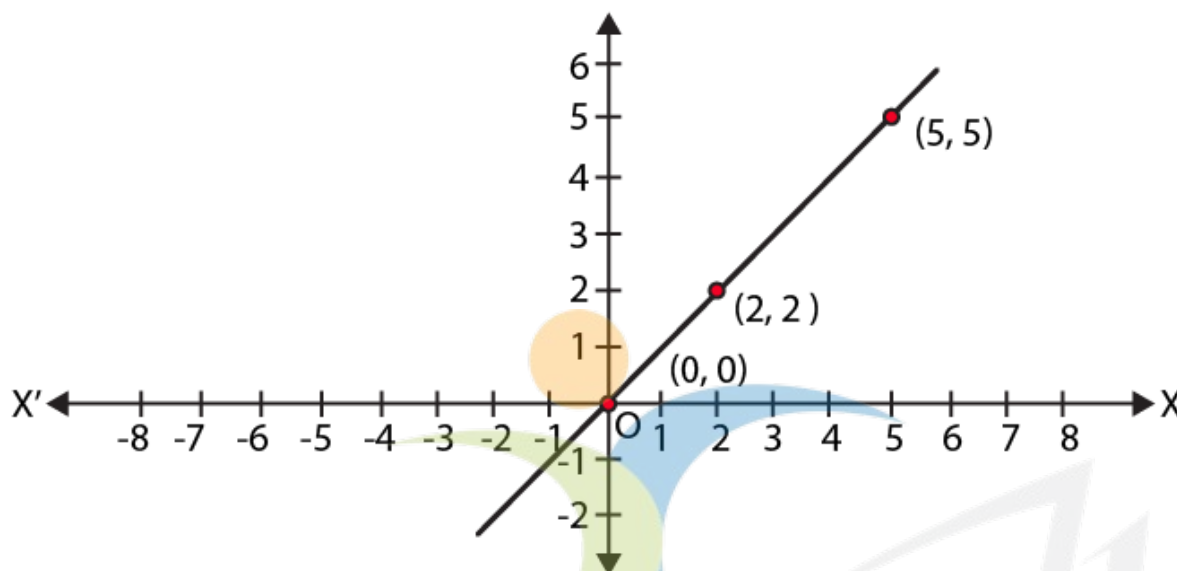
The points $(1, 3)$, $(-1, -1)$, $(-2, -3)$ lie in a straight line,
Hence, the points are collinear.

(ii)



The points $(1, 1)$, $(2, -3)$, $(-1, -2)$ lie in a straight line,
Hence, the points are not collinear.

(iii)



The points $(0, 0)$, $(2, 2)$, $(5, 5)$ lie in a straight line,
Hence, the points are collinear.

5. Without plotting the points indicate the quadrant in which they will lie, if

- (i) ordinate is 5 and abscissa is -3
- (ii) abscissa is -5 and ordinate is -3
- (iii) abscissa is -5 and ordinate is 3
- (iv) ordinate is 5 and abscissa is 3

Solution:

- (i) The point is $(-3, 5)$.
Hence, the point lies in the II quadrant.
- (ii) The point is $(-5, -3)$.
Hence, the point lies in the III quadrant.
- (iii) The point is $(-5, 3)$.
Hence, the point lies in the II quadrant.
- (iv) The point is $(3, 5)$.
Hence, the point lies in the I quadrant.

6. In Fig. 3.6, LM is a line parallel to the y-axis at a distance of 3 units.

- (i) What are the coordinates of the points P, R and Q?
- (ii) What is the difference between the abscissa of the points L and M?

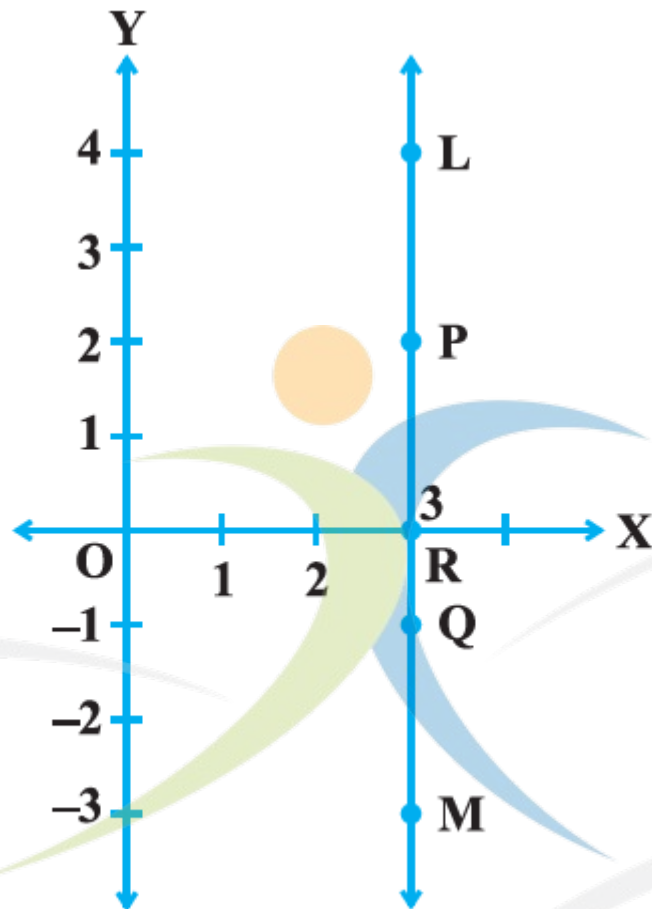


Fig. 3.6

Solution:

(i) The coordinates are:

$$P = (3, 2)$$

$$R = (3, 0)$$

$$Q = (3, -1)$$

(ii) Since, all the points on the line have the same abscissa = 3.

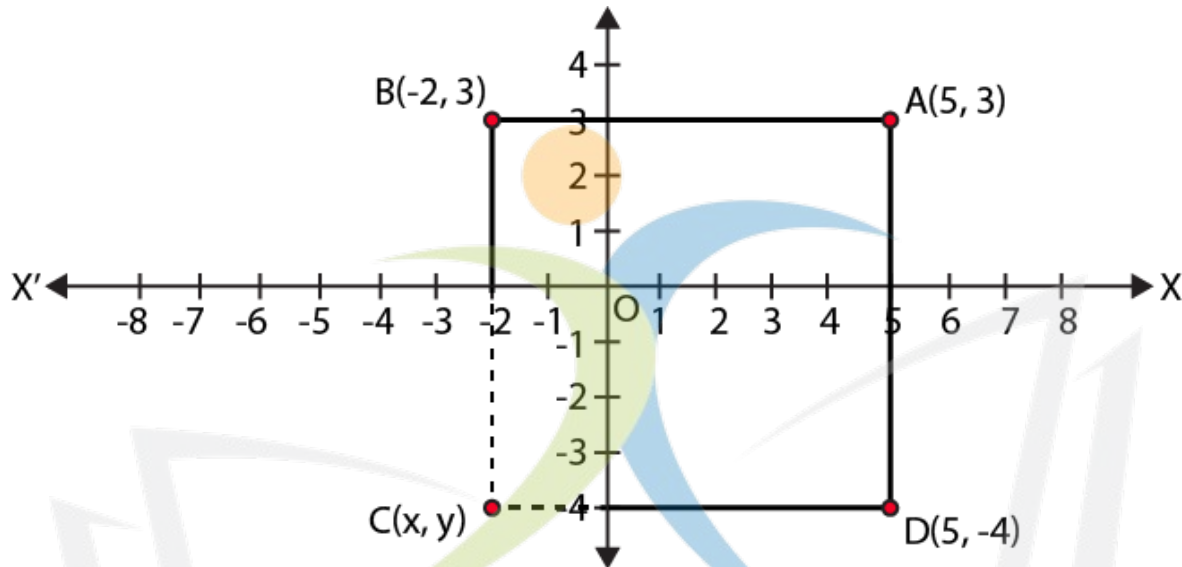
The difference in abscissa of L and M = 0.

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EXERCISE 3.4

1. Points A (5, 3), B (−2, 3) and D (5, −4) are three vertices of a square ABCD. Plot these points on a graph paper and hence find the coordinates of the vertex C.

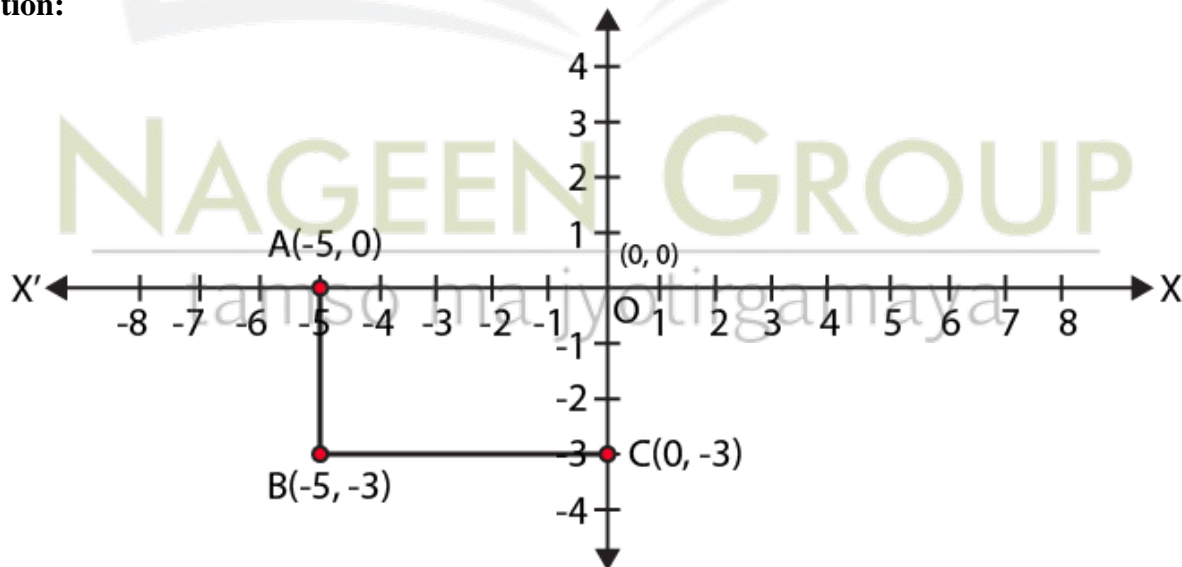
Solution:



From the graph, we get that,
The coordinates of C = (−2, −4).

2. Write the coordinates of the vertices of a rectangle whose length and breadth are 5 and 3 units respectively, one vertex at the origin, the longer side lies on the x-axis and one of the vertices lies in the third quadrant.

Solution:



From the graph, we get that,
The coordinates of the points of the rectangle are (0, 0), (−5, 0), (−5, −3) and (0, −3).

Chapter 3

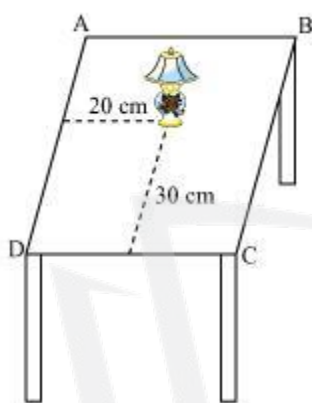
Coordinate Geometry

Exercise 3.1

Question 1:

How will you describe the position of a table lamp on your study table to another person?

Answer:



Consider that the lamp is placed on the table. Choose two adjacent edges, DC and AD. Then, draw perpendiculars on the edges DC and AD from the position of lamp and measure the lengths of these perpendiculars. Let the length of these perpendiculars be 30 cm and 20 cm respectively. Now, the position of the lamp from the left edge (AD) is 20 cm and from the lower edge (DC) is 30 cm. This can also be written as (20, 30), where 20 represents the perpendicular distance of the lamp from edge AD and 30 represents the perpendicular distance of the lamp from edge DC.

Question 2:

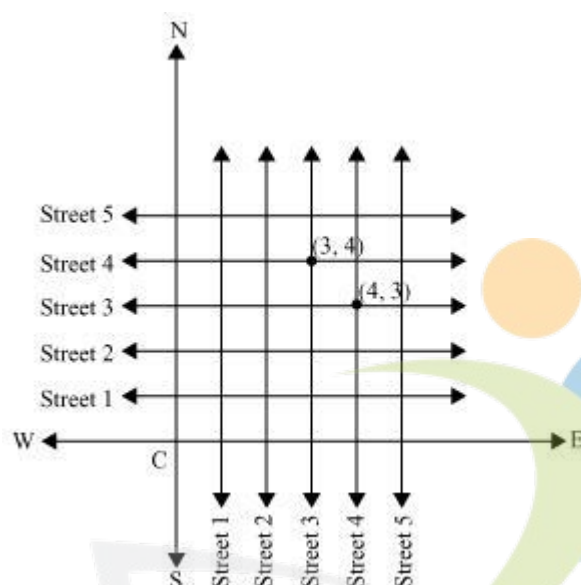
(Street Plan): A city has two main roads which cross each other at the centre of the city. These two roads are along the North-South direction and East-West direction.

All the other streets of the city run parallel to these roads and are 200 m apart. There are about 5 streets in each direction. Using 1 cm = 100 m, draw a model of the city on your notebook. Represent the roads/streets by single lines.

There are many cross-streets in your model. A particular cross-street is made by two streets, one running in the North-South direction and another in the East-West direction. Each cross street is referred to in the following manner: If the 2nd street running in the North-South direction and 5th in the East-West direction meet at some crossing, then we will call this cross-street (2, 5). Using this convention, find:

- (i) How many cross – streets can be referred to as $(4, 3)$.
- (ii) How many cross – streets can be referred to as $(3, 4)$.

Answer:



Both the cross-streets are marked in the above figure. It can be observed that there is only one cross-street which can be referred as $(4, 3)$, and again, only one which can be referred as $(3, 4)$.

Exercise 3.2

Question 1:

Write the **Answer** of each of the following **Questions**:

- (i) What is the name of horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane?
- (ii) What is the name of each part of the plane formed by these two lines?
- (iii) Write the name of the point where these two lines intersect.

Answer:

(i) The name of horizontal lines and vertical lines drawn to determine the position of any point in the Cartesian plane is x-axis and y-axis respectively.

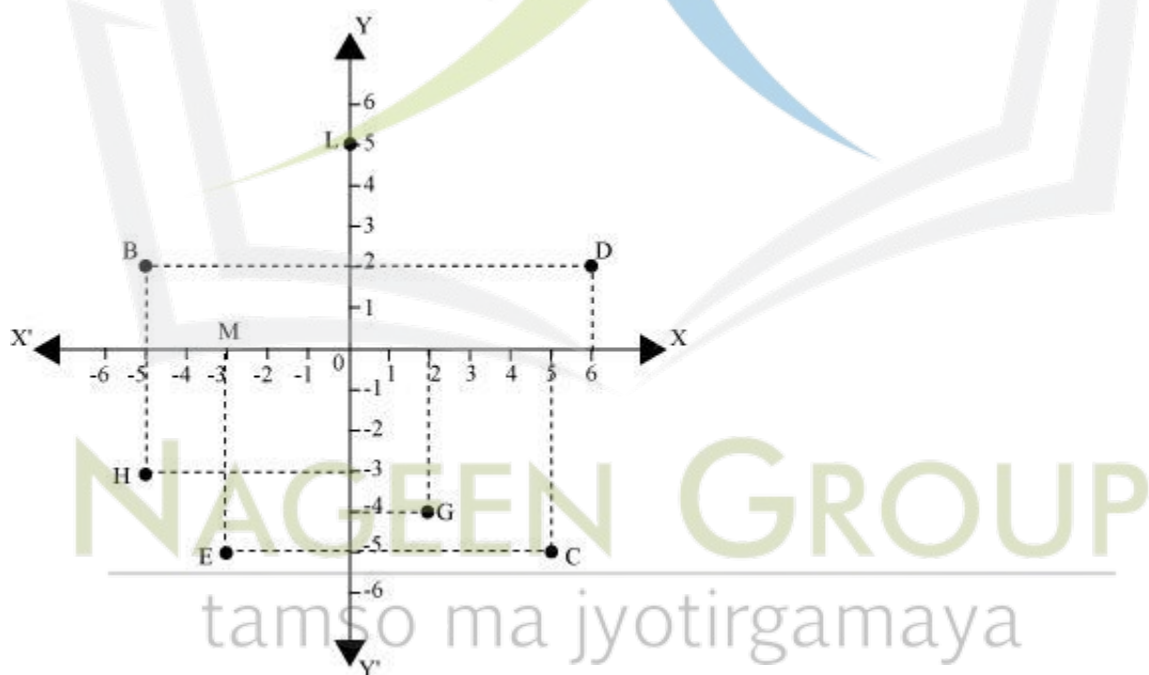
(ii) The name of each part of the plane formed by these two lines, x-axis and y-axis, is quadrant (one-fourth part).

(iii) The name of the point where these two lines intersect is the origin.

Question 2:

See the given figure, and write the following:

- (i) The coordinates of B.
- (ii) The coordinates of C.
- (iii) The point identified by the coordinates $(-3, -5)$.
- (iv) The point identified by the coordinates $(2, -4)$.
- (v) The abscissa of the point D.
- (vi) The ordinate of the point H.
- (vii) The coordinates of the point L.
- (viii) The coordinates of the point M.



Answer:

- (i) The x-coordinate and the y-coordinate of point B are -5 and 2 respectively. Therefore, the coordinates of point B are $(-5, 2)$.
- (ii) The x-coordinate and the y-coordinate of point C are 5 and -5 respectively. Therefore, the coordinates of point C are $(5, -5)$.
- (iii) The point whose x-coordinate and y-coordinate are -3 and -5 respectively is point E.

(iv) The point whose x -coordinate and y -coordinate are 2 and -4 respectively is point G.

(v) The x -coordinate of point D is 6. Therefore, the abscissa of point D is 6.

(vi) The y -coordinate of point H is -3 . Therefore, the ordinate of point H is -3 .

(vii) The x -coordinate and the y -coordinate of point L are 0 and 5 respectively. Therefore, the coordinates of point L are (0, 5).

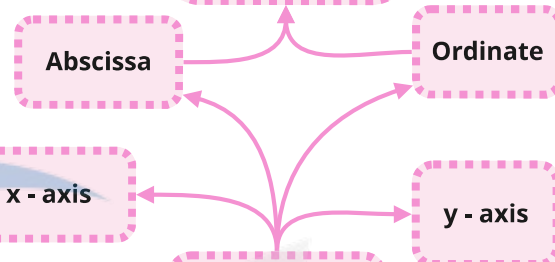
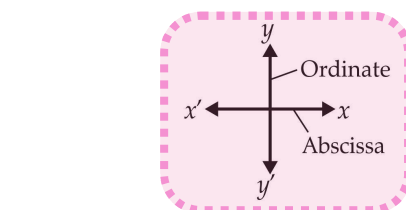
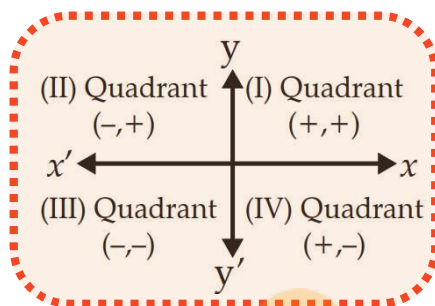
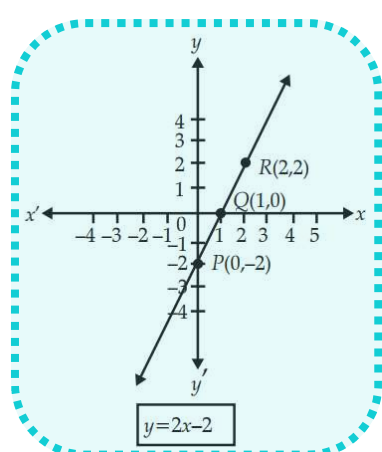
(viii) The x -coordinate and the y -coordinate of point M are -3 and 0 respectively. Therefore, the coordinates of point M is $(-3, 0)$.



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COORDINATE GEOMETRY

MIND MAPD



- Graph-Linear Equation**
- Step 1: Convert given equation in the form $y = mx + c$
 - Step 2: Select atleast 3 values of x , such that $x, y \in I$
 - Step 3: Draw table for the ordered pair (x, y)
 - Step 4: Plot these ordered points on the graph paper
 - Step 5: Draw straight line passing through plotted points.

Graph-Linear Equation

Coordinate system

Coordinate Geometry

Cartesian system

Plotting point in a plan (5, 4)

Quadrants

Fixed point

Meaning

Step 1: Draw co-ordinate axis and select units

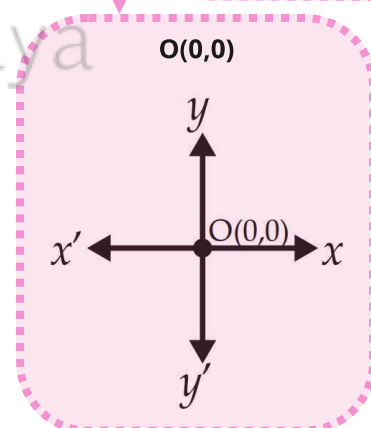
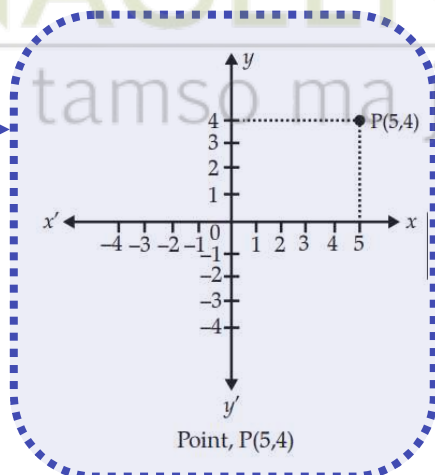
Step 3: Mark the corresponding points

Step 2: Starting from origin, count units on x and y axis

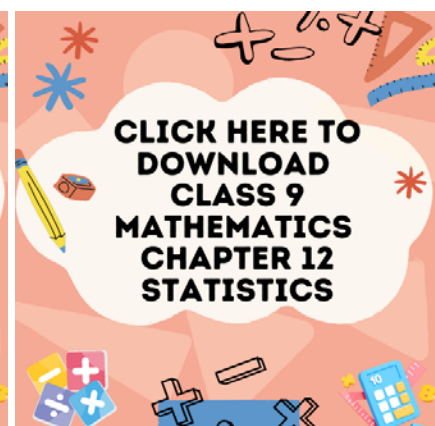
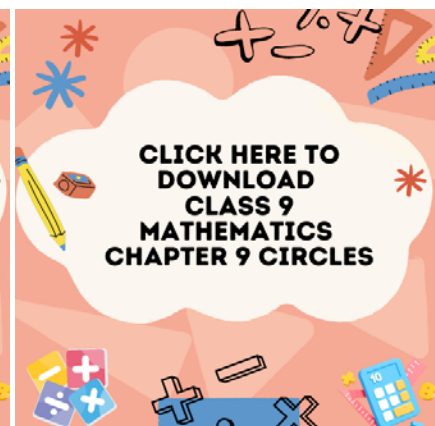
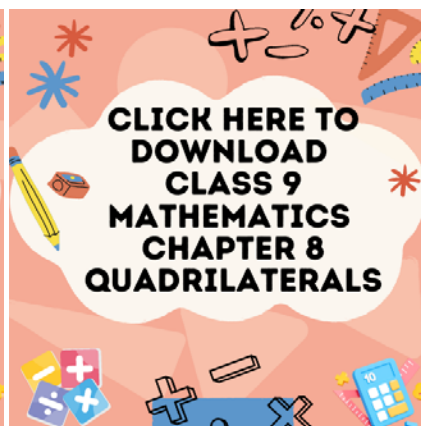
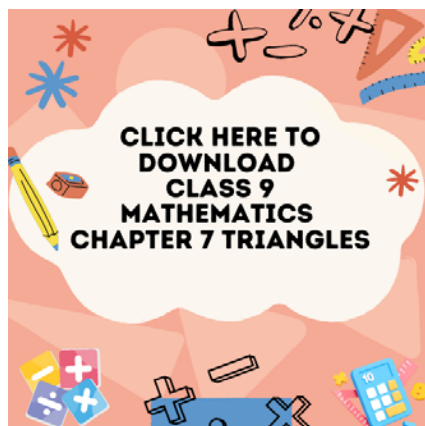
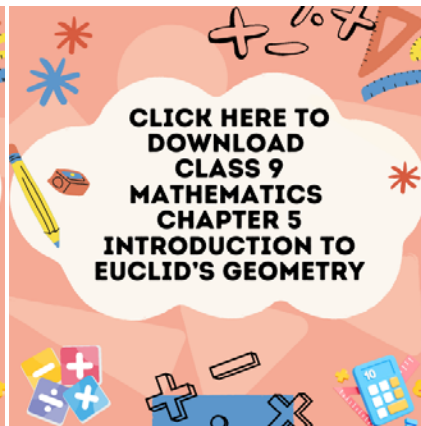
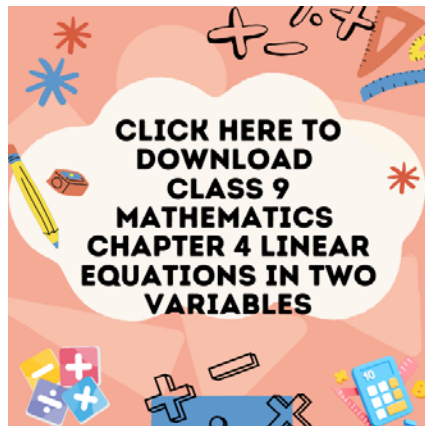
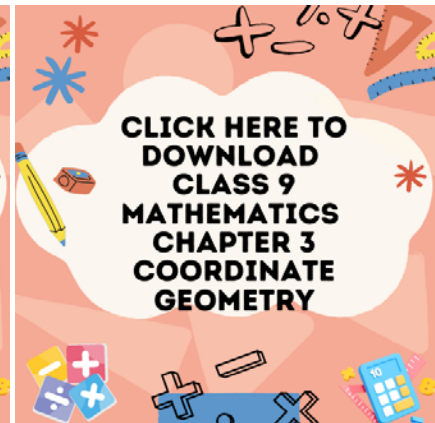
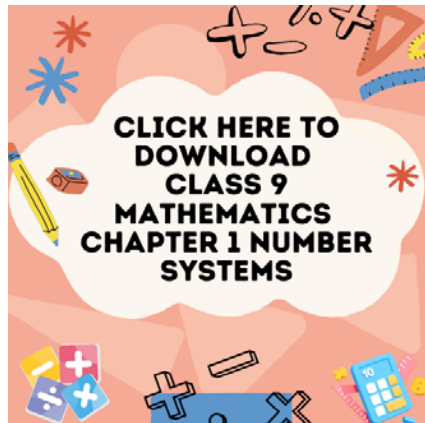
Plane divided into 4 parts by co-ordinate axes

Point where x & y axis intersect

To describe the position of point in a plane



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Innovation



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Marketing/Commercial
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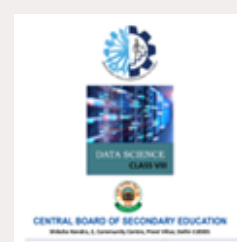
Mass Media - Being Media
Literate



Travel & Tourism



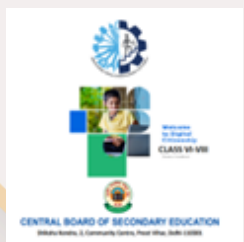
Coding



Data Science (Class VIII
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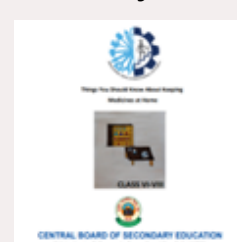
Augmented Reality /
Virtual Reality



Digital Citizenship



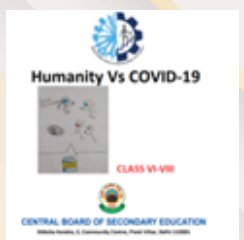
Life Cycle of Medicine &
Vaccine



Things you should know
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at home



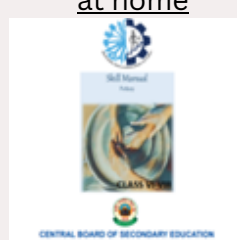
What to do when Doctor
is not around



Humanity & Covid-19



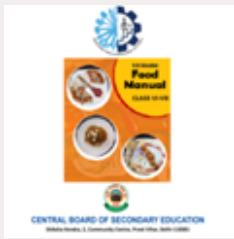
Blue Pottery



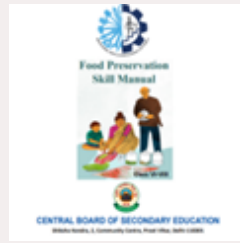
Pottery



Block Printing



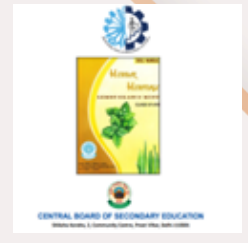
Food



Food Preservation



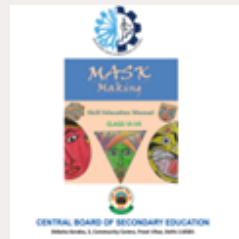
Baking



Herbal Heritage



Khadi



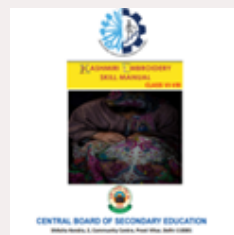
Mask Making



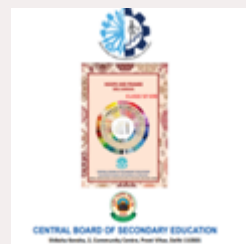
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Making of a Graphic Novel



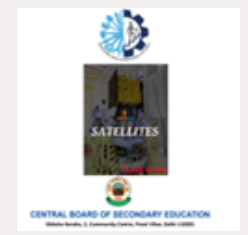
Kashmiri Embroidery



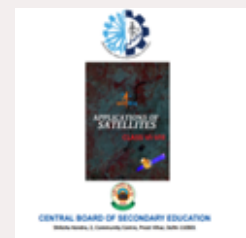
Embroidery



Rockets



Satellites

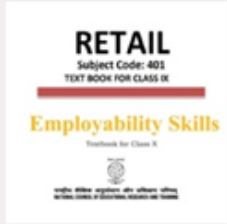


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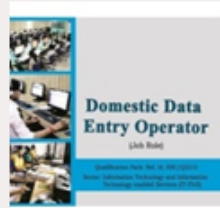


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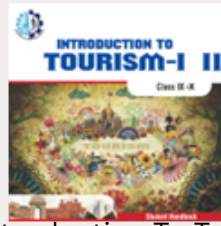
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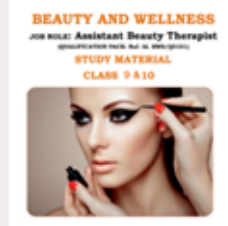
Automotive



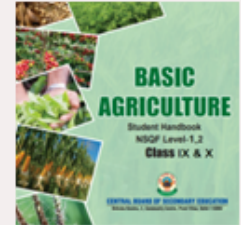
Introduction To Financial Markets



Introduction To Tourism



Beauty & Wellness



Agriculture



Food Production



Front Office Operations



Banking & Insurance



Marketing & Sales



Health Care



Apparel



Multi Media



Multi Skill Foundation Course



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Electronics & Hardware (NEW)

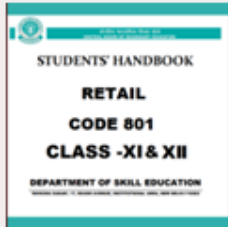


Foundation Skills For Sciences (Pharmaceutical & Biotechnology)(NEW)

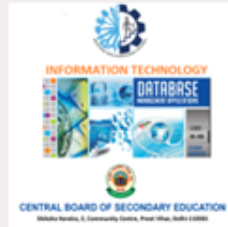


Design Thinking & Innovation (NEW)

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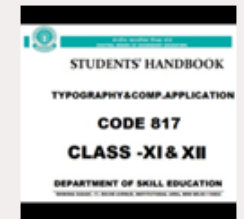
Health Care



Insurance



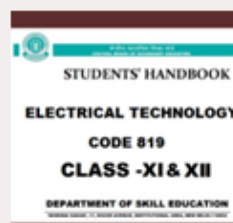
Horticulture



Typography & Comp.
Application



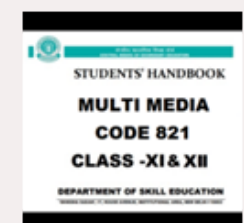
Geospatial Technology



Electrical Technology



Electronic Technology



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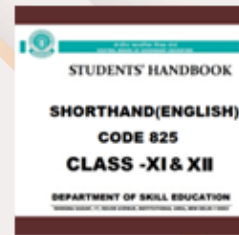
Taxation



Cost Accounting



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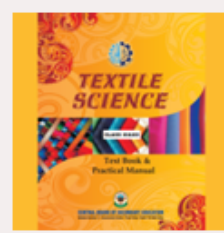
Shorthand (Hindi)



Air-Conditioning & Refrigeration



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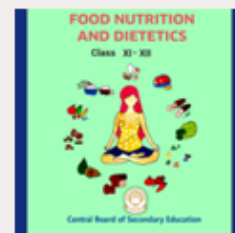
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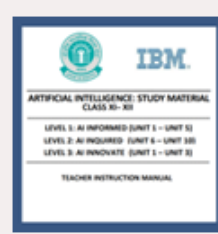
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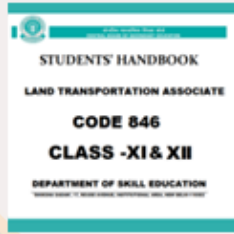
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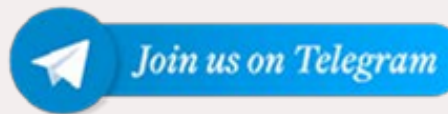
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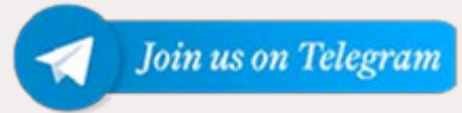
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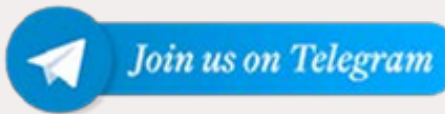
All classes



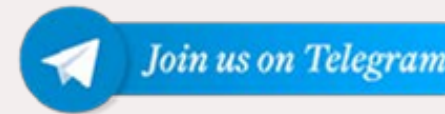
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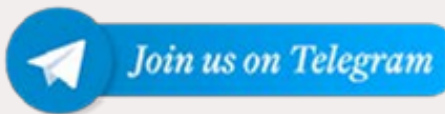
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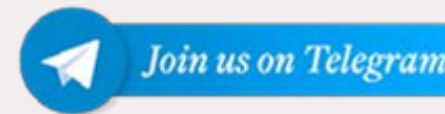
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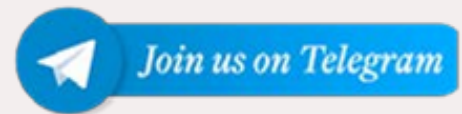
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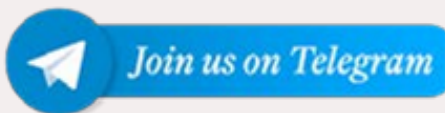
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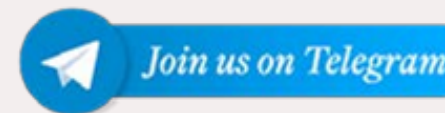
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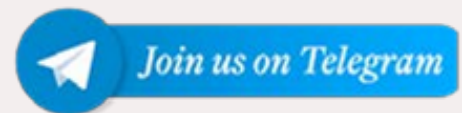
Class 8



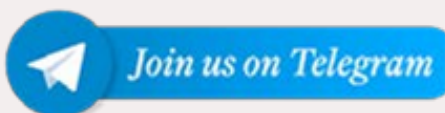
Class 9



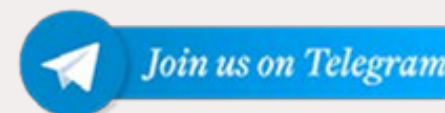
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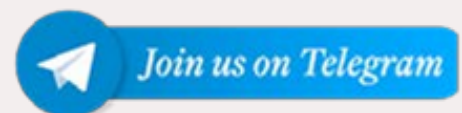
Class 11 (Sci)



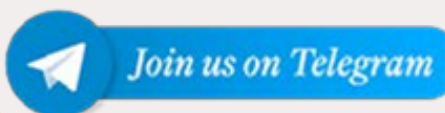
Class 11 (Com)



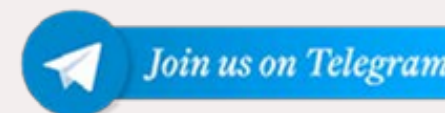
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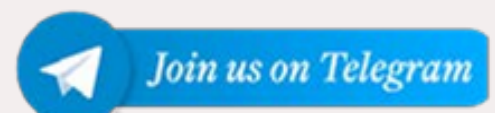
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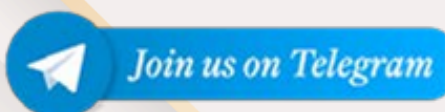
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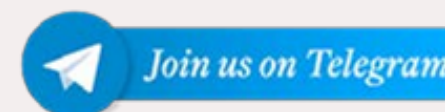
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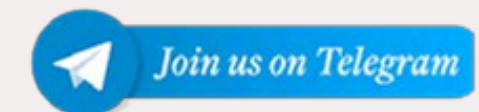
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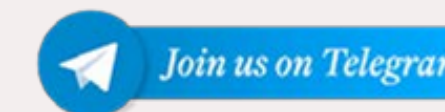
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